FLORA OF GUJARAT STATE

PART I

(pp. 1 to 602)

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FOREWORD

Over the years it has been an urgent need of the country to have national and state floras in order to know and utilize the plant wealth. The publication of "FLORA OF GUJARAT STATE" is a pioneer step in this direction, it being the first flora of the state in the country.

The text is voluminous, accounting for 1800 species (including 150 cultivated ones) belonging to 791 genera spread over 155 families. The keys to the families, genera and species are elaborate and diagnostic and thus they will be useful to the readers for the identification of a taxon. A valuable account of the different types of vegetation and economically important plants of Gujarat adds to the utility of the work. A very exhaustive bibliography and an index to scientific and vernacular names are given at the end of the text.

Dr. G. L. Shah has been in the field of floristics for the last quarter of a century, having published nearly 70 papers in this discipline. Here he comes out with a work of a really high standard as can be judged from the reports of the experts appointed by the University Grants Commission to evaluate the work at the manuscript stage.

I am quite confident that the work will be found very useful to the botanists as also to the non-botanists of Gujarat in particular and of the country in general.

I wish the work great success.

Date : 20–3–1978
Vallabh Vidyanagar

R. D. Patel
Vice-Chancellor

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PREFACE

I am indeed very happy to see that my efforts on the floristics of Gujarat, which were aimed at writing "FLORA OF GUJARAT STATE" are realized. Gujarat can be proud to be the first state in the country to have its own flora. It is sincerely hoped that the book will be useful to teachers, students, phytogeographers, farmers agriculturists, foresters and ecologists in pursuit of their endevours.

The book is divided into two parts as a matter of convenience and bibliography, index and corrections are given in Part II. In spite of utmost care at all stages during preparation of the book, some printing and punctuation errors, some inconsistiencies in abbreviations of authors' names and usage of latin phrases have remained, for which I sincerely regret.

I take this opportunity to thank the U. G. C. for financial assistance and my Ph. D. students for their help in the preparation of this book.

Lastly, I owe very much to my teacher late Dr. H. Santapau S. J. who inspired and trained me in taxonomy.

Vallabh Vidyanagar
20th March, 1978

G. L. Shah

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INTRODUCTION

Plants have many and diverse uses which have a direct or indirect bearing on the civilization of human society. India is a vast country abounding in plant wealth and therefore, it is very important to utilize these plant resources for the welfare of the country men. The late Prime Minister Nehru appropriately wrote in his foreword to the first volume of Wealth of India (1948), "Nevertheless, India is wealthy and the Wealth of India is there, but inspite of this wealth the people are poor. The problem for us is to utilize this stored up wealth of the country in the soil and under the soil for the benefit of Indian humanity". His remarks are very significant because, though the country is very rich in its plant wealth, the information about it is rather insufficient. The exact data such as the distribution of plants in the country, their relative abundance, flowering and fruiting time, and other such information which cannot be deduced by inspection of herbarium specimens are not only necessary but should be based on more thorough and scientific study, so that the plants can be exploited for human welfare.

It is, therefore, of utmost importance that a vast country like that of ours must have a national flora and state floras written on modern lines. The Botanical Survey of India has taken up the project of rewriting the Flora of India with this end in view. In most of the states the botanical explorations are being undertaken and it is sincerely hoped that state floras will see the day of light in course of time.

The botanists of Gujarat have been actively engaged in studying the flora of different parts of the State and considerable information is amassed (See bibliography). It is therefore, possible to pen down this information under the title "FLORA OF GUJARAT STATE".

GEOGRAPHY GEOLOGY, SOIL AND CLIMATIC DATA

The State of Gujarat is situated on the west coast of India between 20° and 25° north latitudes and 68° and 75° east longitudes.

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Its boundaries are defined by Arabian sea on the west, the State of Rajasthan on the north-east, Madhya Pradesh on the east and Maharashtra on the south-east and south. On the north-western fringe it has a common border with Pakistan.

From the point of view of forest distribution and description, the whole of the State can be divided into three distinct zones, viz., (1) area south of the river Narmada consisting of deciduous forests with teak as the main economic species : (2) the area, between the river Narmada and the extreme north excluding Saurashtra and Kutch, covering dry deciduous forests with or without teak and (3) the area of Saurashtra and Kutch, with poor teak forests in Junagadh, scrublands, mangrove forests and desert areas.

Topography :

To the extreme south-east of Gujarat are the hills of Sahyadri. These hills add a great deal to the forest wealth of Gujarat. Further north, the Satpura range separates the State from Khandesh tract of Maharashtra. In the north the plains are broken by irregularly shaped hills which form part of the Satpura and Vindhya hills. The Aravalli ranges run along the north-eastern fringe of the State. Between these irregularly shaped hills are the alluvial valleys built up by Tapti, Narmada, Mahi, Sabarmati and Saraswati rivers draining into the Arabian sea. The Saurashtra Peninsula is connected with the mainland by a neck of low lying lands. In the region, there are famous hills of Gir, Girnar, Barda and Shetrunjaya. Kutch is practically undulating rocky area with many small hills and with the rann of Kutch lying on the northern end, consisting of a vast expanse of tidal mud flats with saline efflorescence,

Geology, Rock and Soil :

Gujarat State can be divided into three distinct geomorphological divisions, viz :

(a) Gujarat Mainland,
(b) Saurashtra Peninsula and
(c) Kutch Peninsula.

The mainland, a rich alluvial terrain, rises from the estuarine tracts between Narmada and Tapti rivers, and extends about 400 km northwards merging into the desert of Rajasthan and the rann of Kutch. It is roughly 120 km wide. The eastern border of the terrain is bounded by Aravalli, Vindhya, Satpura and Sahyadri hills. The gulf of Cambay and the rann of Kutch were perhaps once connected and Nal Sarovar near Ahmedabad probably can be the abandoned arm of the sea (See Patel R. I; 1971).

In Saurashtra Peninsula, the central part forms an elevated table land. The terrain gently slopes towards the peninsular margin. The sedimentary rocks along the coast form almost a flat country.

The mainland of Kutch is isolated by Great Rann on the north and east and Little Rann on the south-east. Here also the central portion forms the table land sloping on all sides. The shape of the region is like a tortoise and hence the name. The Banni is formed by sediments deposited by north flowing rivers in a strip along the northern border of the mainland. The Rann is a dry bed of the remnant of an arm of the sea which once connected the Narmada rift with Sindh and separated Kutch from the mainland. From November to March, the Rann is a barren tract of dry salt-encrusted mud, presenting aspects of almost inconceivable desolation. During the other half of the year it is flooded by waters of rivers that are held back owing to the rise of the sea by the south-west monsoon gales.

Soil :

Soils vary a great deal from zone to zone and also in places in the same zone. Soils in southern districts of west Bulsar, Surat and Broach are deep black. Along the coast there is some alluvium. In some parts they are saline. In east Bulsar and Dangs the soil varies from red, through grey to nearly black. The red soil is typical of deep accumulation of friable detritus found along the lower flats of valleys and in some parts it is rich in ferruginous salts. A change in soil conditions is noticeable as one moves towards the north. Thus, central Gujarat region, consisting of districts of Baroda, Kaira, Ahmedabad, Panchmahals,

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E. Mehsana and E. Sabarkantha, has sandy loam soil, locally known as goradu, from the old alluvium. The northern districts of Mehsana, Sabarkantha and Banaskantha have poor soils. Western Mehsana, Banaskantha and north Sabarkantha have coarse shallow soils derived from granites. In Saurashtra and Kutch the soils are formed of sheets of Deccan lava interspersed with trap dykes. Kutch has a good deal of alluvium. The Northern parts of the districts of Rajkot and Surendranagar have sandy soils derived from sandstones, schists and conglomerates. Along the coastline, saline alluvium is found.

Climatic conditions :

There are three distinct seasons, viz. winter, summer and monsoon. As the Tropic of Cancer passes through the northern border of Gujarat, winters are severe and summers oppressively hot, with wide ranges in diurnal temperatures, except in the coastal tract. Mercury drops quite low, specially in some parts in north, with occasional frost.

Rainfall :

In the following table the average rainfall (in mm) as recorded in different district places of Gujarat for the last 10 years i. e. 1958-67 is given :

Name of the place	Maximum rainfall	Minimum rainfall	Average rainfall
Bulsar	3162	1382	2205
Dangs (Ahwa)	2063	1252	1667
Surat	2084	723	1258
Broach	1284	457	840
Baroda	1475	564	912
Godhra	1263	387	838
Nadiad	1254	343	853
Ahmedabad	1453	394	819
Mehsana	1108	521	589
Himatnagar	1499	470	741
Palanpur	912	386	570
Junagadh	1797	440	1046
Rajkot	1050	405	636
Bhavnagar	1021	412	591
Jamnagar	887	267	548
Bhuj	1153	80	420

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From the table it is clear that the average annual rainfall in South Gujarat in general is more than in other parts of the State, the lowest in Kutch. The average annual rainfall is highest in the southernmost parts of the state and it gradually decreases from South to North. The rains are more in the hilly regions than in the plains, heaviest in Ghat regions of Bulsar and Dangs districts.

The monsoon herlads with a few thunder showers by about the middle of May in the Ghat regions, followed by torrential rains in the month of June. The monsoon months are June-September in the state, but the heaviest rainy month is July, closely followed by August, and with a few light showers sometimes in the first week of October. November to May are rainless months though a few showers are sometimes experienced by the end of December. These showers make little difference to the climate and no change in vegetation, whatsoever, is brought about by them.

Temperature :

The hottest months of the year are April-May throughout the State, the maximum temperature varying in different parts. The maximum temperatures are lower in southern parts of the State (37.8 °C) than in central and northern parts (44.4 °C). The winter season is November–February with colder [illegible] and January. In many northern parts of the [illegible] winter is often severe.

Thus the marked differences in the soil, temperature and annual precipitation in different parts of the state affect the vegetation.

GENERAL PATTERN OF VEGETATION

The wide variations in climate and topography of the State have resulted in various types of forest growth ranging from moist deciduous to pure desert conditions. The major concentration of forests is found all along the eastern border of the State and hilly portions of Saurashtra and some parts of north Gujarat. The plains are mostly devoid of forest cover.

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The forests of the State can be grouped into the following types : (a) *Tropical moist deciduous forests* occur in the southernmost hilly portion of the state comprising Bulsar, Dangs and Surat districts. (b) *Dry deciduous forests* can be divided into (i) *dry teak forests* and (ii) *dry non-teak* forests. The former type occurs in Rajpipla, Chhotaudepur, Panchmahals, Sabarkantha district in North Gujarat and Junagadh and Amreli districts in Saurashtra and the latter type in some parts of Banaskantha district in North Gujarat and Rajkot district in Saurashtra. (c) *Scrub forests* occur in plain countries from Bulsar to Saurashtra and Kutch. (d) Mangrove forests are found in the coastal muddy creeks. "Man-made forests" of *Casuarina equisetifolia* Forst. f. and *Prosopis juliflora* DC. are also found along the coastal strips and many desert borders in Kutch (see map I).

DECIDUOUS FORESTS

In these forests most of the trees begin to shed their leaves by about December and between February and May the forests look very open and at times eye-soring. This effect is aggrevated by lopping carried out by local people, but no area is completely leafless at any one time of the year. The forest composition does not show zonations. However it is arbritrarily divided as follows :

(1) Top layer of trees 8 m or more tall, (2) middle layer of trees and shrubs 2 m to less than 8 m tall, (3) ground layer of the species less than 2 m tall, and (4) twiners and climbers of some of the species found in the forest composition, a few of them may be common, others occasional or rare.

Tectona grandis L. f. is common and abundant in most of the deciduous forests and forms a dominant community. *Acacia chundra* (Roxb.) Willd., *Anogeissus latifolia* (Roxb.) Wall. ex Bedd., *Butea monosperma* (Lam.) Taub., *Dendrocalamus strictus* Nees, *Diospyros melanoxylon* Roxb., *Mitragyna parvifolia* (Roxb.) Korth., Schleichera oleoza (Lour.) Oken and *Terminalia crenulata* Roth are also members of the dominant community.

The other trees in the forest composition are *Adina cordifolia* (Roxb.) Hk. f. ex Brand., *Albizia lebbek* (L.) Bth., *A. odoratissima* (L. f.) Bth., *A. procera* (Roxb.) Bth., *Bombax ceiba* L., *Bridelia retusa* (L.) Spr., *Buchanania lanzan* Spr., *Careya arborea* Roxb., *Cassia fistula* L., *Cochlospermum religiosum* (L.) Alst., *Dalbergia latifolia* Roxb., *D. paniculata* Roxb., *Ehretia laevis* Roxb., *Emblica officinalis* Gaertn. *Ficus arnottiana* Miq., *Garuga pinnata* Roxb., *Gmelina arborea* Roxb., *Grewia tiliaefolia* Vahl, *Heterophragma quadriloculare* (Roxb.) K. Schum., *Hymenodictyon excelsum* (Roxb.) Wall., *Kydia calycina* Roxb., *Lagerstroemia parviflora* Roxb., *Lannea coromandelica* (Houtt.) Merr., *Madhuca indica* Gmel., *Morinda tomentosa* Heyne ex Roth, *Oroxylum indicum* (L.) Vent., *Ougeinia oojeinensis* (Roxb.) Hochst., *Piliostigma malabaricum* (Roxb.) Bth., *Pterocarpus marsupium* Roxb. var. *acuminatus* Prain, *Soymida febrifuga* A. Juss., *Sterculia urens* Roxb. etc.

Middle layer :

Holarrhena antidysenterica (L.) Wall. ex Don, and *Wrightia tinctoria* R. Br. are common and abundant. Other members are *Aegle marmelos* (L.) Corr., *Alangium salvifolium* (L. f.) Wang., *Bauhinia racemosa* Lam., *Carissa congesta* Wt., *Casearia elliptica* Willd., *Cassine glauca* (Rottb.) O. Ktze., *Eriolaena hookeriana* W. & A., *Ficus asperrima* Roxb., *Flacourtia indica* (Burm. f.) Merr., *Gardenia turgida* Roxb., *Helicteres isora* L., *Mallotus philippensis* Muell.-Arg., *Meyna laxiflora* Robyns, *Nyctanthes arbortristis* L., *Trema orientalis* (L.) Bl., *Woodfordia fruticosa* (L.) Kurz, *Xeromphis spinosa* (Thunb.) Keay, *Zizyphus xylopyra* (Retz.) Willd. etc.

Ground layer :

The permanent undergrowth consists of a number of seedlings of tree and shrub species, though during monsoon and post-monsoon period a number of herbs and undershrubs predominate. To list some of them, they are *Achyranthes aspera* L. var. *porphyristachya* Hk. f., *Aerva sanguinolenta* (L.) Bl., *Amorphophallus sylvaticus* Kunth, *Anisochilus carnosa* Wall., Azanza *lampas* (Cav.) Alef., *Baliospermum montanum* (Willd.) Muell.-Arg., *Barleria prattensis* Sant., *Blumea membranacea* DC., *Clitoria biflora*

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Dalz., *Curcuma inodora* Blatt., *Cynoctonum mitreola* (L.) Britt., *Dicliptera roxburghiana* Nees, *Eranthemum roseum* (Vahl) R. Br., *Euphorbia acaulis* Buch.-Ham., *Haplanthus verticillatus* (Roxb.) Nees, *Leea edgeworthii* Sant., *L. indica* (Burm. f.) Merr., *Neuracanthus sphaerostachyus* (Nees) Dalz., *Rungia pectina* (L.) Nees, *Sida glutinosa* Cav., S. *retusa* L., *Solanum indicum* L., *Spilanthes paniculata* Wall. ex DC., *Trachyspermum stictocarpum* Wolff. var. *stictocarpum* etc.

Twiners or Climbers :

A number of twiners or climbers are found in the forests, many of them woody. To mention some of them, they are *Acacia pennata* (L.) Willd., *Aspidopteris cordata* (Heyne ex Wt.) A. Juss., *Butea parviflora* Roxb., *Cansjera rheedii* Gmel., *Celastrus paniculata* Willd., *Cissus repanda* Vahl, *Clematis hedysarifolia* DC., *Combretum ovalifolium* Roxb., *Cryptolepis buchanani* R. & S., *Cylista scariosa* Roxb., *Dioscorea* species, *Hiptage bengalensis* (L.) Kurz, *Marsdenia tenacissima* W. & A., *Millettia racemosa* Bth., *Pueraria tuberosa* (Roxb.) DC., *Vernonia divergens* (Roxb.) Edgew., *Ventilago denticulata* Willd. and *Zizyphus rugosa* Lam.

SCRUB FORESTS

Scrub forests are widely distributed on the arid and semi-arid zones of the earth where the total rainfall ranges from 25-100 cm. The vegetation presents a very open appearance so that the trees and shrubs are widely spaced. The bulk of the vegetation consists of co-dominant, spinous shrubs and trees capable of great drought resistance. It may be classified into two categories as follows :

(1) The permanent vegetation occurring throughout the year and (2) the temporary vegetation consisting of the annuals growing mainly during short rainy season. Corresponding to this, the area presents two distinct seasonal aspects : (1) The summer and winter aspects when most of the trees and shrubs flower and the soil is devoid of the ground cover, and (2) the rainy season aspect when the vegetation is at its best and the soil, which is otherwise barren between the trees and shrubs, is

covered by a vivid-green carpet of a temporary vegetation. The latter flowers and fruits in a short time and disappears soon the surface layer of the soil dries up as winter sets in.

The permanent vegetation is xerophytic and consists of trees and shrubs, the former 5–11 m tall (rarely upto 16 m high).

The typical members of the scrub forest are *Acacia nilotica* (L.) Willd. subsp. *indica* (Bth.) Brenan, *Acacia senegal* Willd., *Balanites aegyptiaca* (L.) Del., *Capparis decidua* (Forsk.) Edgew., *Capparis sepiaria* L., *Dichrostachys cinerea* W. & A., *Commiphora wightii* (Arn.) Bhandari, *Limonia acidissima* L., *Zizyphus nummularia* (Burm. f.) W. & A. etc.

The general composition of the vegetation is arbitrarily divided as follows :

Trees :

Other members in the forests are *Acacia leucophloea* Willd., *Anogeissus sericea* Brand., *Calotropis procera* (Ait.) R. Br., *Capparis grandis* L. f., *Cassia auriculata* L., *Grewia gharaf* (Forsk.) Ehrenb. & Aschers., *Grewia tenax* (Forsk.) Fiori, *G. villosa* Willd., *Holoptelea integrifolia* Planch., *Indigofera oblongifolia* Forsk., *Maytenus emarginata* (Willd.) D. Hou, *Mimosa hamata* Willd., *Prosopis cineraria* (L.) Macbr., *Salvadora persica* L., *Zizyphus horrida* Roth and *Z. mauritiana* Lam. In addition, some members typical of the deciduous forests are also found in the forest composition. To mention a few, they are *Bombax ceiba* L., *Butea monosperma* (Lam.) Taub., *Diospyros melanoxylon* Roxb., *Miliusa tomentosa* (Roxb.) Sinel. and *Tectona grandis* L. f.

Along road sides, railway lines and open wastelands, a number of weeds are found either scattered or in pure or mixed patches. A few of them are *Acanthospermum hispidum* DC., *Abelmoschus manihot* (L.) Medic., *Amaranthus spinosus* L., *Bidens biternata* (Lour.) Merr. & Sherff, *Blumea eriantha* DC., *Cassia occidentalis* L., *C. tora* L., *Cleome gynandra* L., *Cleome viscosa* L., *Corchorus olitorius* L., *Jatropha gossypifolia* L., *Martynia annua* L.,

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Sida acuta Burm. f., *S. alba* L., *Solanum surattense* Burm. f., *Tephrosia purpurea* (L.) Pers., *T. villosa* (L.) Pers., *Tribulus terrestris* L., *Vernonia cinerea* (L.) Less. and *Withania somnifera* L.,

Clerodendrum inerme (L. f.) Gaertn., *Euphorbia neriifolia* L., *E. nivulia* Buch.-Ham., *Jatropha curcas* L., *Lawsonia inermis* L., etc. are used as hedges around cultivated fields. By virtue of the habit *Anisomeles indica* (L.) O. Ktze., *Barleria prionitis* L., *Caesalpinia crista* L., *Capparis sepiaria* L., *Kirganelia reticulata* (Poir.) Baill., *Lantana camara* L. var. *aculeata* (L.) Mold., *Maytenus emarginata* (Willd.) D. Hou, *Peristrophe bicalyculata* (Retz.) Nees, *Salvadora oleoides* Decne., *S. persica* L., etc. form dense and often impenetrable natural hedges. In these hedges a number of shrubs or trees like *Acacia nilotica* (L.) Del. subsp. *indica* (Bth.) Brenan, *Annona squamosa* L., *Azadirachta indica* A. Juss., *Cadaba fruticosa* (L.) Druce, *Clerodendrum multiflorum* (Burm. f.) O. Ktze., *Delonix elata* (L.) Gamble, *Diospyros chloroxylon* Roxb., *Grewia flavescens* Juss. and *Streblus asper* Lour. are found. Of a number of herbs found here *Achyranthes aspera* L. var. *aspera*, *Bergia suffruticosa* (Del.) Fenzl, *Boerhavia chinensis* (L.) Druce, *B. diffusa* L., *Dipteracanthus prostratus* (Poir.) Nees, *Launaea procumbens* (Roxb.) Ram. & Raj., *Crotalaria burhia* Buch.-Ham. ex Bth., *Leptadenia reticulata* W. & A., *Phyllanthus fraternus* Webst., *Pupalia lappacea* (L.) Juss., *Setaria tomentosa* (Roxb.) Kunth, *S. verticillata* (L.) P. Beauv., *Sida cordata* (Burm. f.) Borss., *Solanum nigrum* L., *Tridax procumbens* L. are common. A number of twiners and climbers belonging to the families Acanthaceae, Aselpiadaceae, Capparaceae, Convolvulaceae, Cucurbitaceae, Papilionaceae, Menispermaceae, Mimosaceae, Vitaceae, etc. are found on the hedges. Some of the conspicuous ones by virtue of their foliage or flower colour are *Acacia torta* (Roxb.) Craib, *Canavalia gladiata* (Jacq.) DC., *Cardiospermum halicacabum* L., *Dalechampia scandens* L var. *cordofana* Muell.-Arg., *Maerua oblongifolia* A. Rich., *Mucuna prurita* HK. f, etc.

VEGETATION OF PONDS AND DITCHES

Most of the ditches and temporary ponds are filled up with water during monsoon, in the second half of which a

number of plants of the hydrophytic vegetation appear. They are classified as submerged, floating and wet land plants.

Submerged : *Aponogeton natans* (L.) Engl. & Krause, *Blyxa echinosperma* Hk. f., *B. octandra* (Roxb.) Planch. ex Thw., *Ceratophyllum demersum* L., *Hydrilla verticillata* (L. f.) Royle, *Najas graminea* Del., *N. kurziana* Rendle, *N. marina* L., *N. minor* All., *Nechamandra alternifolia* (Roxb.) Thw., *Ottelia alismoides* (L.) Pers., *Potamogeton crispus* L., *P. nodosus* Poir., *P. pectinatus* L., *P. perfoliatus* L., *Utricularia inflexa* Forsk. var. *stellaris* (L. f.) Taylor and *Vallisneria spiralis* L.

Floating : *Azolla* sp., *Eichhornia crassipes* (Mart.) Solms., *Ipomoea aquatica* Forsk., *Lemna gibba* L., *L. paucicostata* Heglm., *L. trisulca* L., *Limnophyton obtusifolia* (L.) Miq., *Ludwigia adscendens* (L.) Hara, *Nelumbo nucifera* Gaertn., *Neptunia oleracea* Lour., *Nymphaea pubescens* Willd., *N. stellata* Willd., *Nymphoides cristatum* (Roxb.) O. Ktze., *N. indicum* (L.) O. Ktze., *N. parviflorum* (Griseb.) O. Ktze., *Oryza nivara* Sharma & Shashtri, *Pistia stratiotes* L., *Spirodela polyrrhiza* Schleid., *Trapa natans* L. var. *bispinosa* (Roxb.) Makino, *Utricularia gibba* L. subsp. *exoleta* (R. Br.) Taylor. *Wolffia arrhiza* Wimm. and *W. microscopica* Kurz.

Wetland or marshy plants :

A number of species are found in this habitat. Some typical ones are *Ageratum conyzoides* L., *Ammannia baccifera* L., *Bacopa monnieri* (L.) Pennell, *Bergia ammannioides* Roxb. ex Roth, *Caesulia axillaris* Roxb., *Cardamine trichocarpa* Hochst. ex A. Rich., *Chrozophora rottleri* (Geis.) A. Juss., *C. prostrata* Dalz., *Chenopodium album* L., *Cochlearia cochlearioides* (Roth) Sant. & Mahesh., species of Commelinaceae, Cyperaeae, *Eriocaulon*, Gramineae, *Gnaphalium* and *Lindernia*, *Heliotropium supinum* L., *Hoppea dichotoma* Willd., *Hydrolea zeylanica* Vahl, *Hygrophila auriculata* Heine, *Limnophila indica* (L.) Druce, *Lobelia alsinoides* Lam., *Mazus pumilus* (Burm. f.) Steenis, *Mecardonia procumbens* (Mill.) Small, *Merremia gangetica* (L.) Hall. f., *Phyllanthus lawii* Grah., *Polycarpon prostratum*

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(Forsk.) Aschers. & Schweinf., *Polygonum plebeium* R. Br., *Portulaca oleracea* L., *Pulicaria foliolosa* DC., *Ranunculus sceleratus* L., *Rorippa indica* (L.) Hiern, *Rumex dentatus* L., *Sagittaria sagittifolia* L., *Salvia plebeia* R. Br., *Sesili diffusum* (Roxb. ex DC.) Sant. & Wagh, *Sphaeranthus indicus* L., *Sutera dissecta* (Del.) Walp., *Typha angustata* Borry & Chaub., *Vahlia digyna* (Retz.) O. Ktze. and *Veronica anagallis – aquatica* L. By the on set of the hot season most of the species begin to disappear with drying of the soil and in extremely hot season a few hardy plants such as *Argemone mexicana* L., *Coldenia procumbens* L., *Gantelbua urens* Bremek., *Glinus lotoides* L., *Grangea maderaspatana* (L.) Poir. and *Heliotropium ovalifolium* Forsk. survive.

VEGETATION ALONG RIVER BANKS

The river beds at some places are stony, rocky or pebbly and at times water-logged; at other places they are moist alluvial or sandy.

In the stony, rocky or pebbly river beds *Crinum defixum* Ker-Gawl., *C prattense* Herb., *Cryptocoryne retrospiralis* Kunth, *Ficus heterophylla* Lour., *Homonoia retusa* Muell., *H. riparia* Muell., *Rotala serpyllifolia* (Roth) Bremek., *Rotula aquatica* Lour., *Saccharum spontaneum* L., *Salix tetrasperma* Roxb., *Syzygium heyneanum* Wall. ex Duthie, *Tamarix ericoides* Rottl., *Vitex negundo* L., etc. are common and abundant, often in scattered, small or large patches. On flat rocks *Capellipedium hugelli* (Hack.) Camus, *Chrysopagon fulvus* (Spr.) Chiov., *C. serrulatus* Trin., *Melanocenchris jacquemontii* J. & S. and *Spodiopogon rhizophorus* (Steud.) Pilg. are some typical common plants.

The vegetation in alluvial moist soil is similar to the one found in wet or marshy lands (see pp. 11-12).

The sandy soil in river beds supports a very poor vegetation and some of the typical common plants are *Alhagi pseudalhagi* (Bieb.) Desv., *Citrullus colocynthis* (L.) Schrad., *Eragrostis tremula* Hochst., *Gisekia pharnaceoides* L., *Heliotropium marifolium* Retz., *Indigofera cordifolia* Heyne ex Roth, *Lantana salvifolia* Jacq., *Mollugo cerviana* Ser. and *Urginea indica* L.

Some typical plants on rock cutting, hilly slopes and old walls are *Aristida adscensionis* L., *Arthraxon lancifolius* (Trin.) Hochst., *Canscora diffusa* (Vahl) R. Br., *Capparis cartilaginea* Decne., *Cayratia carnosa* Gagnep., *Convolvulus microphyllus* Sieb. ex Spr., *Cyathocline purpurea* (Don) O. Ktze., *Didymocarpus pygmaeus* Cl., *Eragrostis ciliaris* (L.) R. Br., *Eriophorum comosun* Wall. ex Nees, *Kickxia incana* (Wall.) Bennell, *K. ramossisima* (Wall.) Janch., *Lepidagathis trinervis* Wall. ex Nees, *Lindenbergia muraria* (Roxb.) P. Bruehl, *Nepeta bombaiensis* Dalz., *N. hindostana* (Heyne ex Roth) Haines, *N. hindostana* (Heyne ex Roth) Haines var. *woodrowii* (Cooke) Sant., *Peperomia pellucida* (L.) H. B. K., *Pupalia lappacea* (L.) Juss., *Sarcostemma acidum* (Roxb.) Voigt and *Woodfordia fruticosa* (L.) Kurz. Some of them are very common and abundant, often masses of them growing in large patches.

VEGETATION ALONG SEA SHORES AND SALINE GROUND

The vegetation can be divided into salt marshes and mangroves growing in low lying muddy shores and sandy saline areas (i) under the influence of tides or (ii) permanently saline soil as in some parts of north Gujarat. The main feature of the salt marsh is the zonation i. e. mangroves form a distinct belt followed by sandy flat areas and salt pans.

The mangrove vegetation is chiefly dominated by *Avicennia marina* (Forsk.) Vierh and *A. officinale* L.; other members in the mangrove community are *Aegiceras corniculata* (L.) Blanco, *Bruguiera gymnorhiza* (L.) Lam., *Ceriops tagal* (Pers.) Rob., *Rhizophora conjugata* L. and *R. mucronata* Lam.

On mud flats *Arthrocnemum indicum* (Willd.) Moq. *Peplidium maritimum* (L. f.) Wettst., *Salicornia brachiata* Roxb., *Salvadora persica* L. (bushes), *Sesuvium portulacastrum* L., *Suaeda fruticosa* Forsk. ex Gmel., *S. maritima* (L.) Dum. and *S. nudiflora* Moq. are common, some of them scattered or in small or large patches.

A little inter ior, the soil is less sandy and saline. In these mud flats a number of plants typical of the habitat are found,

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some of them occurring in small or large, pure or mixed colonies. To mention a few of them, they are *Aeluropus lagopoides* (L.) Trin. ex Thw., *Alhagi pseudalhagi* (Bieb.) Desv., *Artiplex stocksii* Boiss., *Capparis decidua* (Forsk.) Edgew., *Cassia italica* (Mill.) Lam. ex F. W. Andrews, *Cenchrus biflorus* Roxb., *Chloris villosa* (Desf.) Pers., *Corchorus depressus* (L.) Stocks, *Cressa cretica* L., *Cyperus bulbosus* Vahl, *Diplachne fusca* (L.) P. Beauv., *Fimbristylis cymosa* R. Br., *Indigofera oblongifolia* Forsk., *Juncus maritimus* L., *Malachra capitata* L., *Lycium barbarum* L., *Salvadora persica* L., *Scirpus tuberosus* Desf., *Sporobolus maderaspatenus* Bor, *Trianthema triquetra* Rottl. & Willd. and *Urochondra setulosa* (Trin.) C. R. Hubb.

The vegetation of coastal sandy strands is colonized by *Aeluropus lagopoides* (L.) Trin. ex Thw., *Cyperus arenarius* Retz., *C conglomeratus* Rottb., *Indigofera cordifolia* Heyne ex Roth, *Launaea sarmentosa* (Willd.) Alst. and *Spinifex littoreus* (Burm. f.) Merr.

A number of other species also occur on the sands, scattered, or in small or large patches. A few of them are *Arnebia hispidissima* DC., *Chlorophytum tuberosum* (Roxb.) Baker, *Corbichonia decumbens* (Forsk.) Exell, *Crotalaria burhia* Buch.-Ham. ex Bth., *C. notonii* W. & A., *C. pusilla* Heyne ex Roth., *Cymbopogon jwarancusa* (Jones) Schult., *C. schoenanthus* (L.) Spreng., *Dactyloctenium sindicum* Boiss., *Elyonurus royleanus* Nees ex Steud., *Fagonia cretica* L., *Farsetia jacquemontii* Hk. f. & Th., *Gisekia pharnaceoides* L., *Halopyrum mucronatum* (L.) Stapf, *Hibiscus lobatus* (Murr.) O. Ktze., *Indigofera oblongifolia* Forsk., *Juncus bufonius* L., *J. maritimus* L., *Leptadenia pyrotechnica* (Forsk.) Decne., *Limonum stocksii* (Boiss.) O. Ktze., *Lotus garcini* DC., *Opuntia elatior* Mill., *Panicum trypheron* Schult., *P. turgidum*, Forsk., *Pedalium murex* L., *Peganum harmala* L., *Polycarpaea corymbosa* (L.) Lam., *P. spicata* W. & A., *Portulaca tuberosa* Roxb., *Psilosta chys sericea* Hk. f., *Remirea maritima* Aubl., *Salsia santolinaefolia* Boiss., *Seetzenia orientalis* Decne., *Sericostoma pauciflorum* Stocks ex Wt., *Tephrosia uniflora* Pers. subsp. *petrosa* (Blatt. & Hallb.) Gillett, *Tribulus alata* Del., and *Zygophyllum simplex* L.

Some of the other grasses in sandy areas are *Aristida adscensionis* L., *A. hystrix* L. f., *A redacta* Stapf, *Cenchrus biflorus* Roxb.,

Chloris barbata Sw., *C. montana* Roxb., *Chrysopogon fulcus* (Spr.) Chiov., *Crypsis schoenoides* (L.) Lam., *Cynodon dactylon* (L.) Pers., *Dactyloctenium aegyptium* (L.) P. Beauv., *Desmostachya bipinnata* (L.) Stapf, *Dichanthium annulatum* (Forsk.) Stapf, *Eleusine compressa* (Forsk.) Aschers. & Schweinf. ex C Christ., *Eragrostis ciliaris* (L.) R. Br., *E. tenella* (L.) P. Beauv. ex R. & S., *E. tremula* Hochst., *Eremopogon foveolatus* (Del.) Stapf, *Melanocenchris jacqemontii* J. & S., *Panicum antidotale* Retz., *Paspalidium flavidum* (Retz.) A. Camus, *Perotis indica* (L.) O. Ktze., *Saccharum spontaneum* L., *Sehima nervosum* (Rottl.) Stapf, *Sporobolus diander* (Retz.) P. Beauv., *S. helvolus* (Trin.) Dur. & Sch., *S. marginatus* Hochst. ex A. Rich., *Tetrapogon villosus* Desf., *Tragus biflorus* Schult. and *Urochondra setulosus* (Trin.) C. E. Hubb.

VEGETATION OF CULTIVATED FIELDS

During the course of botanical explorations in different parts of the state, a number of weeds similar to those found in wet or mashy land, have been collected or noted in cultivated fields. Some worthy of mention are *Anagallis arvensis* L. var *coerulea* (Schreb.) Gren. & Godr., *Aristolochia bracteolata* Lam., *Asphodelus tenuifolius* Cav., *Astragalus prolixus* Sieb., *Blumea oxyodonta* DC. *Biophytum sensitivum* (L.) DC., *Catharanthus pusillus* (Murr.) G. Don, *Centaurium centaurioides* (Roxb.) Rao & Hemadri, *Cleome monophylla* L., *Convolvulus rottlerianus* Choisy var. *tenella* Cl. and *Crotalaria orixensis* Willd.

PARASITIES IN THE AREA

The root parasites are *Aeginetia indica* L., *Buchnera hispida* Buch.-Ham., *Centranthera indica* (L.) Gamble, *Cistanche tubulosa* Wt., *Orobanche aegyptiaca* L., *O. cernua* Locfl. var. *nepalensis* DC., *Ramphicarpa longiflora* (Arn.) Bth., *Sopubia delphinifolia* (Roxb.) G. Don, *S. trifida* Buch.-Ham. ex G. Don, *Striga angustifolia* (D. Don) Saldhana, *S. densiflora* Bth., *S. gesneroides* (Willd.) Vatke and *S. lutea* Lour.

The stem parasites are *Cassytha filiformis* L., *Cuscuta chinensis* Roxb., *C. reflexa* Roxb., *Dendrophthoe falcata* (L. f.) Ettings., *Santalum album* L. and *Viscum articulatum* Burm. f.

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SEASONAL CHANGES IN THE VEGETATION

With the first few showers of rain in early June, several bulbous plants of the families. Amaryllidaceae, Araceae, Hypoxidaceae, Liliaceae, Orchidaceae and Zingiberaceae come in flowers, some of them even before the leaves appear. Of them the commoner ones are *Amorphophallus commutatus* (Schott) Engl., *Chlorophytum tuberosum* (Roxb.) Baker, *Curculigo orchioides* Gaertn., *Curcuma inodora* Blatt., *Habenaria grandiflori formis* Blatt. & McC., *Nervilia aragoana* Gaud., *Pancratium triflorum* Roxb., *Sauromatum venustum* (Ait.) Kunth and *Scilla hyacinthina* (Roth) Macbr. Soon after that in a week or two a variety of grasses sprout up and the whole ground becomes carpeted with a vivid green. By early July, among these grasses a number of species are found. Some of the common ones are *Ageratum conyzoides* L., *Alysicarpus vaginalis* (L.) DC., *Arisaema neglectum* Schott, *A. tortuosum* (Wall.) Schott, *Bidens biternata* (Lour.) Merr. & Sherff, *Biophytum sensitivum* (L.) DC., *Boerhavia diffusa* L., *Borreria articularis* (L. f.) F. N. Will., *B. stricta* (L. f.) K. Schum., *Cassia pumila* Lam., *Celosia argentea* L., species of Commelinaceae and Cyperaceae, *Enicostema hyssopifolium* (Willd.) Verd., *Evolvulus alsinoides* (L.) L., *Euphorbia parviflora* L., *Habenaria gibsonii* Hk. f. var. *foliosa* (A. Rich.) Sant. & Kapad., *Hybanthus enneaspermus* (L.) F. Muell., *Impatiens balsamina* L. var. *coccinea* Hk. f., *Phyllanthus fraternus* Webst., *P. virgatus* Forst., *Polygala chinensis* L. and *Trichodesma amplexicaule* Roth., *Setaria glauca* (L.) P. Beauv. is quite conspicuons by its reddish-brown spikelets.

Most of the monocotyledons are short lived and they disappear by the middle of the rainy season. By this time grasses grow quite tall, some of them occuring in pure or mixed patches and are often spotable either by their height, inflorescence or the habit. To mention some of such grasses, they are *Apluda mutica* L., *Coix lachryma-jobi* L., *Cymbopogon gidarba* (Ham.) Haines var. *gidarba*, *C. schoenanthus* (L.) Spr., *Heteropogon contortus* (L.) P. Beauv. ex R. & S., *Imperata cylindrica* (L.) P. Beauv., *Panicum antidotale* L., *Phragmites karka* (Retz.) Trin., *Pseudanthistiria heteroclita* (Roxb.) Hk. f., *Saccarum spontaneum* L., *Sorghum halepense* (L.)

Pers., *Themeda quadrivalvis* (L.) O. Ktze. and *Thysanolaena maxima* (Roxb.) O. Ktze. Other common grasses are *Alloteropsis cimicina* (L.) Stapf, *Aristida adscensionis* L. var. *adscensionis*, *Brachiaria ramosa* (L.) Stapf, *Cenchrus biflorus* Roxb., *Dactyloctenium aegyptium* (L.) P. Beauv., *Desmostachya bipinnata* Stapf, *Dichanthium annulatum* (Forsk.) Stapf, *Digitaria adscendens* (H. B. & K.) Henr., *Echinochloa colonum* (L.) Link, *Eragrostis tenella* P. Beauv., *E. unioloides* (Retz.) Nees, *Paspalidium flavidum* (Retz.) A. Camus often forming loose mats.

Among these grasses a number of species, in addition to those mentioned above, are found by this time. *Abelmoschus manihot* (L.) Medic., *Aerva lanata* (L.) Juss., *Amaranthus spinosus* L., *Azanza lampas* (Cav.) Alef., *Blainvillea acmella* (L.) Philip., *Crotalaria leptostachya* Bth., *C. mysorensis* Roth, *Hibiscus hirtus* L., *Indigofera tinctoria* L., *Justicia simplex* Don, *Leea edgeworthii* Sant., *L. macrophylla* Roxb. ex Hornem., *L. indica* (Burm. f.) Merr., *Neuracanthus sphaerostachyus* (Nees) Dalz., *Oxalis corniculata* L., *Trichodesma amplexicaule* Roth, *T. zeylanicum* (Burm. f.) R. Br., *Triumfetta rhomboidea* Jacq., *T. pentandra* A. Rich., etc. are common. A few of the rare ones, worthy of mention, are *Conyza stricta* Willd., *Justicia betonica* L., *Peucedanum grande* Cl., *Pimpinella heyneana* Wall., *Senecio dalzelli* Cl., *S. grahami* Hk. f., *Smithia salsuginea* Hance, *S. setulosa* Dalz., *Trichodesma sedgwickianum* Banerjee, *Tricholepis amplexicaulis* Cl., *T. glaberrima* DC. and *Triumfetta annua* L. By this time *Celosia argentea* L. and *Impatiens balsamina* L. var. *coccinea* Hk. f. have become abundant and most noticeable plants by their flowers. *Acanthospermum hispidum* DC., *Cassia tora* L., *Celosia argentea* L., *Impatiens balsamina* L. var. *coccinea* Hk. f. occur in dense, pure stands at some places. The twiners or climbers among these grasses belong to the families Asclepiadaceae, Convolvulaceae, Cucurbitaceae, Sapindaceae and Papilionaceae.

By the end of monsoon or a little latter, most of the grasses dry up. Some species like *Barleria prionitis* L., *Blumea* various species, *Eranthemum roseum* (Vahl) R. Br., *Peristrophe bicalyculata* (Retz.) Nees, *Rungia pectinata* (L.) Nees, *Vicoa indica* (Willd.) DC. etc, become dominant at many places and grow gregariously.

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In the beginning of the hot season the ground cover has almost disappeared but for a few hardy plants. Many trees like *Ailanthus excelsa* Roxb., *Butea monosperma* (Lam.) Taub., *Bombax ceiba* L., *Firmiana colorata* (Roxb.) R. Br., *Garuga pinnata* Roxb., *Gmelina arborea* Roxb., *Holoptelea integrifolia* (L.) Planch., *Lannea coromandelica* (Houtt.) Merr., *Madhuca indica* Gmel., *Miliusa tomentosa* (Roxb.) Sincl., *Ougeinia oojeinensis* (Roxb.) Hochr., *Schleichera oleosa* (Lour.) Oken and *Sterculia urens* Roxb. shed their leaves and bear flowers. Some of the quite conspicuous ones by their flowers are *Butea monosperma* (Lam.) Taub., *Bombax ceiba* L., *Crateva nurvala* Roxb. var. *nurvala*, *Firmiana colorata* (Roxb.) R. Br. and *Garuga pinnata* Roxb.; *Madhuca indica* Gmel. and *Schleichera oleosa* (Lour.) Oken can be easily spotted from a distance by the bright reddish—purple new foliage.

EFFECTS OF BIOTIC FACTORS ON THE VEGETATION

The vegetation is often considerably modified by the biotic factors operating on it :

Indiscriminate cutting of the forest trees by the local people for fuel and other purposes affect the vegetation in many ways; (a) some trees and shrubs like *Butea monosperma* (Lam.) Taub., *Diospyros melanoxylon* Roxb., *Lagerstroemia parviflora* Roxb. and *Terminalia crenulata* Roth, which otherwise are elegant with straight and tall trunks, often look crooked or mutilated. This, of course, does not affect their reproductive cycle. (b) It may also cause either complete disappearance of some tree and shrub species or they become rare. (c) A continuous process of indiscriminate cutting promotes regeneration of scrub forests. The occurrence of some trees like *Bombax ceiba* L., *Buchanania lanzan* Spr., *Bridelia squamosa* (Lam.) Gerhm., *Diospyros melanoxylon* Roxb., *Gmelina arborea* Roxb., *Lannea coromandelica* (Houtt.) Merr., *Miliusa tomentosa* (Roxb.) Sincl., *Soymida febrifuga* A. Juss., *Sterculia urens* Roxb., *Tectona grandis* L. f. etc. in the scrub forests may suggest the vegetation of such areas in the past might have been similar to that of deciduous forests in hilly regions but it might have been subjected to the continuous operation of biotic factors for the

last many years. As a result the thorny trees and shrubs have taken dominance. The clearing of forests for agriculture purposes and urban development has enhanced the effect. The herbivors indiscriminately graze on the seddlings of tree and shrub species and the herbaceous vegetation, with the result that many herbaceous species, especially the rare ones, are seldom seen in all the stages of development. The seedlings of shrub and tree species often do not attain their full growth.

The indiscriminate cutting of trees for the past several years has thinned down many forests. This has reduced the abundance and intensity of the rains. The water retaining capacity of the soil is also reduced and much rain water flows away causing soil erosions at several places. This has a direct impact on the agriculture of the state. Many rivers are often in spate, causing severe damage to crops, human society and vegetation by uprooting many perennial species including trees and shrubs.

The occurrence of edaphic type and seral or degraded type of vegetations can be attributed to excessive biotic interferences. The vegetation is very poor and consists of stunted and scattered bushes of *Acacia nilotica* (L.) Willd. subsp. *indica* (Bth.) Brenan, *Balanites aegyptiaca* (L.) Del., *Capparis decidua* (Forsk.) Edgew., *Cassia auriculata* L., *Crotalaria burhia* Buch.-Ham. ex Wall., *Croton bonplandianum* Baill., *Indigofera oblongifolia* Forsk., *Maytenus emarginata* (Willd.) D. Hou, *Mimosa hamata* Willd., *Prosopis cineraria* (L.) Macbr., *Tephrosia purpurea* (L.) Pers., *Zizyphus nummularia* (Burm. f.) W. & A., etc. In addition, the ground is covered with small or large, loose or dense, scattered patches of *Bergia suffruticosa* (Del.) Fenzl, *Citrullus colocynthis* (L.) Schrad, *Leptadenia reticulata* W. & A. and *Tribulus terrestris* L.

Biotic factors also operate in a different way, that is to say, by introduction of exotic species. The seeds of a number of exotic plants have been introduced in this country inadvertantly. Such plants are naturalized in many parts of the country and they are now the integral members of the indigenous flora.

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Some such exotic weeds are : *Acanthospermum hispidum* DC., *Ageratum conyzoides* L., *Alternanthera paronychioides* St. Hil., *A. pungens* H. B. & K., *Argemone mexicana* L., *Croton bonplandianum* Baill., *Cryptostegia grandiflora* R. Br., *Datura innoxia* Mill., *Desmodium neomexicanum* A. Gray, *Eichhornia crassipes* (Mart.) Solms., *Erigeron bonariensis* L., *Euphorbia geniculata* Ort., *E. prostrata* Ait., *Evolvulus nummularius* (L.) L., *Gomphrena celosioides* Mart., *Hyptis suaveolens* Poit., *Jatropha gossypifolia* L., *Ipomoea hederifolia* L., *Lantana camara* L. var. *aculeata* (L.) Mold., *Majus pumilus* (Burm. f.) Steenis, *Martynia annua* L., *Mecardonia procumbens* (Mill.) Small, *Nicotiana plumbaginifolia* Viv., *Opuntia elatior* Mill., *Parthenium hysterophorus* L., *Passiflora foetida* L , *Scoparia dulcis* L., *Solanum torvum* Sw., *Synedrella nodiflora* Gaertn., *Tridax procumbens* L. and *Xanthium strumarium* L.

Similarly several species under cultivation as ornamental or crop plants are found as escapes or naturalized. A few of such species are *Antigonon leptopus* Hk. & Arn., *Chrysanthemum indicum* DC., *Cichorium intybus* L., *Citrullus lanatus* (Thunb.) Mats. & Nakai, *Coccinia grandis* (L.) Voigt, *Eupatorium odoratum* L. forma *squarrosum* Koster. f., *Eruca sativa* Mill., *Hymenatherum tenuifolium* Cass., *Ipomoea fistulosa* Mart. ex Choisy, *I. quamoclit* L., *Lepidium sativum* L., *Mimosa pudica* L., *Parkinsonia aculeata* L., *Pennisetum typhoides* (Burm. f.) Stapf & Hubb., *Pentapetes phoenicia* L., *Polygonum fagopyrum* L., *Raphanus sativus* L., *Ruellia tuberosa* L., *Vallaris solanacea* (Roth) O. Ktze. and *Verbesina encelioides* (Cav.) Bth. & Hk.f. ex. A. Gray.

Casuarina equisetifolia J. R. & G. Forst. and *Prosopis juliflora* (Sw.) DC. have been introduced in many parts of the state particularly in the coastal area but the latter species has become an obnoxious weed by its prolific distribution and acclamatization. However in a flora, it is imperative that such exotic weeds and escapes from cultivation will have to be included to do justice to the vegetation of an area.

ECONOMICALLY IMPORTANT PLANTS

The information on the vegetation and flora of the state is incomplete without a list of variously economically important plants. A list is, therefore, appended.

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Cereals :

Amaranthus hybridus L. var *cruentus* (L.) Thell. var. *paniculatus* (L.) Thell., *Avena sterilis* L. var. *culta* Raizada, *Eleusine coracana* (L.) Gaertn., *Hordeum vulgare* L., *Panicum sumatrense* Roth ex R. & S., *Paspalum scrobiculatum* L., *Pennisetum typhoides* (Burm. f.) Stapf & Hubb., *Setaria italica* (L.) P. Beauv., *Sorghum vulgare* (L.) Pers., *Triticum aestivum* L. and *Zea mays* L.

Pulses :

Cajanus cajan (L.) Millsp., *Cicer arietinum* L., *Lablab purpureus* (L.) Sw., *Lathyrus sativus* L., *Pisum sativum* L., *Vigna aconitifolia* (Jacq.) Marechal, *V. angularis* (Willd.) Ohwi & Ohashi, *V. radiata* (L.) Wilczek var. *radiata*, *V. unguiculata* (L.) Walp. subsp. *cylindrica* (L.) Eseltine and *V. unguiculata* (L.) Walp. subsp. *unguiculata*.

Vegetables :

Abelmoschus esculentus (L.) Moench., *Allium sativa* L., *Amaranthus tricolor* L., *Amorphophallus campanulatus* Bl., *Anethum graveolens* L., *Basella rubra* L., *Beta vulgaris* L., *Brassica oleracea* L. var. *botrytis* L., *B. oleracea* L. var. *capitata* L., *B. oleracea* L. var. *gongylodes* L., *Coccinia grandis* (L.) Voigt, *Colocasia esculenta* (L.) Schott, *Cucubita maxima* Duch., *Cucumis sativus* L., *Cyamopsis tetragonoloba* (L.) Taub., *Daucus carota* L. var. *sativa* DC., *Dioscorea alata* L., *D. bulbifera* L., *D. oppositifolia* L., *Holostemma annularium* (Roxb.) Schum., *Ipomoea batatas* L., *Lagenaria leucantha* (Roxb.) Rusby, *Luffa acutangula* Roxb., L. *cylindrica* (L.) M. J. Roem., *Lycopersicon lycopersicum* (L.) Sant., *Madhuca indica* Gmel., *Momordica charantia* L., *M. dioica* Roxb. *Moringa oleifera* Lam., *Musa paradisiaca* L., *Raphanus caudatus* L., *R. sativus* L., *Sesbania grandiflora* (L.) Pers., *Solanum melongena* L., *S. tuberosum* L., *Spinacea oleracea* L., *Telosma pallida* (Roxb.) Craib and *Trichosanthes dioica* Roxb.,

Fruits :

Annona reticulata L., *A. squamosa* L., *Averrhoa carambola* L., *Borassus flabellifer* L., *Buchanania lanzan* Spr., *Capparis decidua* (Forsk.) Edgew., *Carica papaya* L., *Citrullus lanatus* (Thunb.) Mat. & Nakai,

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Citrus limon (L.) Burm. f., *Cucumis melo* L., *Cordia dichotoma* Forst. f., *C. gharaf* (Forsk.) Ehrenb. ex Asch., *Dillenia pentagyna* Roxb., *Diospyros melanoxylon* Roxb., *Emblica officinalis* Gaertn., *Hibiscus sabdariffa* L., *Limonia acidissima* L., *Mangifera indica* L., *Manilkara hexandra* (Roxb.) Dub., *M. zapota* (L.) v. Royen, *Meyna laxiflora* Robyns, *Miliusa tomentosa* (Roxb.) Sincl., *Musa paradisiaca* L., *Opuntia elatior* Mill., *Pithecellobium dulce* Bth., *Phoenix sylvestris* Roxb., *Psidium guajava* L., *Spondias pinnata* (L. f.) Kurz, *Tamarindus indica* L., *Trapa natans* L. var. *bispinosa* (Roxb.) Makino, *Terminalia catappa* L., *Zizyphus mauritiana* Lam., *Z. nummularia* (Burm. f.) W. & A., *Z. rugosa* Lam., and *Z. xylopyra* Willd.

Other edible plants :

Cyperus bulbosus Vahl (bulbs), *Nelumbo nucifera* Gaertn. (rhizomes, fleshy thalamus and achenes), *Nymphaea pubescens* Hk. f. & Th. and *N. stellata* Willd. (underground rhizome).

Fibre yielding plants :

Bombax ceiba L., *Calotropis gigantea* (L.) R. Br., *C. procera* (Ait.) R. Br., *Corchorus capsularis* L., *C. olitorius* L., *Crotalaria juncea* L., *Gossypium herbaceum* L. var. *acerifolium* (Guill. & Perr.) Chev., *G. arboreum* L., *Helicteres isora* L., *Hibiscus cannabinus* L., *Malachra capitata* L. and *Urena lobata* L.

Fodder plants :

Cultivated ones are : *Crotalaria juncea* L., *Cyamopsis tetragonoloba* (L.) Taub. and *Medicago sativa* L. The grasses serve as natural fodder plants but among them some species viz. *Dichanthium annulatum* (Forsk.) Stapf, *Bothriochloa pertusa* (L.) A. Camus, *Chrysopogon fulvus* (Spr.) Chiov., *Cynodon dactylon* (L.) Pers., *Dactyloctenium aegyptium* (L.) P. Beauv., *Eleusine compressa* (Forsk.) Aschers. & Schweinf., *Eremopogon foveolatus* Stapf, *Heteropogon contortus* P. Beauv., *Panicum antidotale* Retz., *Sehima nervosum* (Rottl.) Stapf and *Sorghum halepense* (L.) Pers. are good and palatable.

Other crop plants :

Nicotiana tabacum L., *Plantago ovata* L. and *Saccharum officinarum* L.

Spices and condiments :

Allium cepa L., *Anethum graveolens* L., *Brassica juncea* L., *Capsicum annuum* L. var. *acuminatum* Fingerh., *Cocos nucifera* L., *Coriandrum sativum* L., *Cuminum cyminum* L., *Cymbopogon citratus* (DC.) Stapf, *Foeniculum vulgare* Mill., *Hibiscus cannabinus* L., *H. sabdariffa* L., *Mentha spicata* L., *Murraya koenigii* (L.) Spr., *Peucedanum grande* Cl., *Papaver somniferum* L., *Sesamum indicum* L., *Trachyspermum ammi* (L.) Sprague and *Trigonella foenum-graecum* L.

Beverages :

The fresh sap from *Borassus flabellifer* L. and *Phoenix sylvestris* Roxb. is a healthy beverage.

Oil yielding plants : Oil of commerce is obtained mostly from seeds, very rarely from leaves or roots. The following is the list :

Seeds : *Arachis hypogaea* L., *Azadirachta indica* Juss., *Derris indica* (Lam.) Bennet, *Guizotia abyssinica* Cass., *Madhuca indica* Gmel., *Mimusops elengi* L., *Ricinus communis* L., *Schleichera oleosa* (Lour.) Oken and *Sesamum indicum* L. Leaves : *Cymbopogon citratus* (DC.) Stapf, *Cymbopogon martinii* (Roxb.) Wats. and *Eucalyptus* sp. Roots : *Vetiveria zizanoides* (L.) Nash

Tooth brushes :

Tender branches of *Acacia nilotica* (L.) Del. subsp. *indica* (Bth.) Brenan, *Azadirachta indica* A. Juss., *Cassia auriculata* L., *Ficus benghalensis* L. and *Salvadora persica* L. are used as tooth brushes.

Bidi wrappers :

The leaves of *Bauhinia racemosa* Lam. and *Diospyros melanoxylon* Roxb. are used for this purpose. The auction of the leaves by the forest department fetches a small forest revenue.

Timber trees :

The major revenue for the forest department comes from the timber of some species. The best quality of timber is obtained

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from : *Acacia chundra* (Roxb.) Willd., *Adina cordifolia* (Roxb.) Bth. & Hk. f. ex Brand., *Bambusa arundinacea* Willd., *Dalbergia latifolia* Roxb., *Gmelina arborea* Roxb., *Ougeinia oojeinensis* (Roxb.) Hochr., *Pterocarpus marsupium* Roxb. var. *acuminatus* Prain and *Tectona grandis* L. f. The timber of inferior quality is obtained from *Albizia lebbeck* (L.) Bth., *A. procera* (Roxb.) Bth., *Anogeissus latifolia* Wall. ex Bedd., *Lagerstroemia lanceolata* Wall. ex W. & A., *L. parviflora* Roxb., *Terminalia arjuna* (Roxb.) W. & A., *T. bellirica* (Gaertn.) Roxb. and *T. crenulata* Roth.

Minor forest products : Match wood species are : *Ailanthus excelsa* Roxb., *Bombax ceiba* L., *Garuga pinnata* Roxb., *Holoptelea integrifolia* (Roxb.) Planch., *Hymenodictyon excelsum* (Roxb.) Wall., *Kydia calycina* Roxb., *Lannea coromandelica* (Houtt.) Merr., *Spondias pinnata* (L.f.) Kurz and *Wrightia tinctoria* R. Br. Dye yielding species are : *Acacia chundra* (Roxb.) Willd., *Cassia fistula* L. and *Zizyphus xylopyra* Willd. (bark) and *Butea monosperma* (Lam.) Taub. (flowers). Resin and gum yielding plants are : *Acacia chundra* (Roxb.) Willd., *A. farnesiana* Willd., *A. nilotica* (L.) Del. subsp. *indica* (Bth.) Brenan, *A. senegal* Willd., *Azadirachta indica* Juss., *Boswellia serrata* Roxb. ex Colebr., *Commiphora wightii* (Arn.) Bhandari, *Garuga pinnata* Roxb., *Pterocarpus marsupium* Roxb. var. *acuminatus* Prain, *Sterculia urens* Roxb. and *Terminalia crenulata* Roxb. Tannin yielding plants are : *Avicennia marina* Vierh., *A. officinalis* L., *Bruguiera gymnorhiza* (L.) Lam., *Cassia auriculata* L., *C. occidentalis* L., *Rhizophora mucronata* Lam. and *Zizyphus mauritiana* Lam.

Ornamental plants :

A number of plants which are priced either as shade trees or ornamental because of their majestic flowers are grown in gardens or along roads. Only the frequently planted ones are listed :

Acalypha wilkesiana Muell.–Arg., *Allamanda cathartica* L. var. *hendersonii* Bailey, *Albizia lebbeck* (L.) Bth., *Althea rosea* (L.) Cav., *Azadirachta indica* Juss., *Bauhinia purpurea* L., *Bougainvillea glabra* Choisy, *B. spectabilis* Willd., *Cassia fistula* L., *C. javanica* L., *C. renigera* Wall. ex Bth., *C. roxburghii* DC., *C. siamea* Lam., *Casuarina*

equisetifolia J. R. & G. Forst., *Catharanthus roseus* (L.) G. Don., *Cestrum diurnum* L., *C. nocturnum* L., *Dalbergia sissoo* Roxb., *Delonix regia* (Boj.) Raf., *Drypetes roxburghii* (Wall.) Hurus, *Duranta repens* L., *Emblica officinalis* Gaertn., *Ervatamia divaricata* (L.) Burkill, *Erythrina variegata* L., *Euphorbia heterophylla* L., *Ficus benghalensis* L., *F. religiosa* L., *Gliricidia sepium* Walp., *Gomphrena globosa* L., *Gossypium barabadense* L., *Haplophragma adenophyllum* (Wall.) P. Dop, *Hibiscus rosa-sinensis* L., *Ipomoea cairica* (L.) Sw., *Jacaranda mimosifolia* D. Don, *Jasminum flexile* Vahl, *J. multiflorum* (Burm.f.) Andr., *Kigelia pinnata* L., *Kalanchoe pinnata* (Lam.) Pers., *Lagerstroemia indica* L., *Melia azaderach* L., *Millingtonia hortensis* L.f., *Mimusops elengi* L., *Nerium indicum* L., *Ocimum canum* Sims, *O. sanctum* L., *Passiflora edulis* L., *Peltophorum pterocarpum* (DC.) Baker, *Polyalthia longifolia* (Sonn.) Thw., *Quisqualis indica* L., *Roystonea regia* (H.B. & K.) O.F. Cooke, *Syzygium cumini* (L.) Skeels, *Tamarindus indica* L., *Tecoma stans* (L.) H. B. & K., *Thevetia peruviana* (Pers.) Merr. and *Turnera ulmifolia* L.

THE PLAN FOLLOWED IN ENUMERATION OF PLANTS

For the sake of convenience, Bentham and Hooker's order (*Genera Plantarum*, 1862–1883) has been followed and the same is followed by Hooker (*Flora of British India*, 1872–1897) and Cooke (*Flora of the Presidency of Bombay*, 1958, reprinted) also. As regards splitting of the families, I have adopted, in general, Hutchinson's classification (1959).

The keys provided in the present work are largely based on macroscopic characters and they are artificial. They have been divided into three main parts. (i) a general key to the families, (ii) key to the genera of each family and (iii) key to the species in different genera. An attempt has been to make the keys as dichotomous as possible.

The nomenclature adopted in the present work is the one used in authentic taxonomic literature published in India and abroad and is consistent with the rules of *International Code of Botanical Nomenclature* (Stafleu, 1972). When the name other than the

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one appearing in Hooker's *Flora of British India* has been adopted, the basionym, on which the newer name is based, has also been given showing the date of the latter so that the names adopted are in conformity with the Rule of Priority.

The following works have been cited throughout in abbreviated forms.

FBI — Sir J. D. Hooker, *Flora of British India.*
C — Cooke, Th. *Flora of the Presidency of Bombay* (reprinted).
Bor — Bor, N. L. *Manual of the Indian Forest Botany.*
Ch & O .. Chavan, A. R. & Oza, G. M. *The Flora of Pavagadh.*
Bailey .. Bailey, L. H., *Manual of cultivated plants.*
WI : *Wealth of India* C. S. I. R. Publication.
S&J .. Santapau, H. & Janardhanan, K. P., *Flora of Saurashtra*, Check – list.

The genera within a family and species within a genus are arranged alphabetically as a matter of convenience. In the description of a species the measurements are given in metric system. The measurements of plant parts e.g. leaves 4–8 x 3–6 cm mean 4–8 cm long and 3–6 cm broad.

The key to the families, genera and species in most cases are diagnostic and elaborate; hence, for the sake of brevity, descriptions to the families and genera are omitted. Each species is provided with a short but diagnostic description, followed by a note on its habitat, relative abundance and flowering and fruiting time. The vernacular names as they have appeared in the works on the flora of different parts of the state and those which have been ascertained by the author during botanical excursions are given in capital letters in parenthesis after phenological data. Where necessary, the authenticity of a taxon is indicated by the collector's name, and his collection number(s) are also given in parenthesis along with phenological data.

For the sake of convenience the State of Gujarat is divided into 5 zones – Kutch, Saurashtra, North Gujarat, Central Gujarat and South Gujarat. Saurashtra is made up of Jamnagar, Junagadh,

Rajkot, Amreli, Bhavnagar and Surendranagar districts. Banaskantha, Mehsana, Sabarkantha and Ahmedabad districts make up North Gujarat whereas Kaira, Panchmahals and Baroda districts the Central Gujarat. South Gujarat consists of four districts – Broach, Surat, Bulsar and Dangs (see map II). Some of the important localites within these zones, cited in the text, are as follows: North Gujarat : Palanpur, Idar, Khedbrahma, Mahudi, Mansa; Central Gujarat : Tuwa, Mahi ravines, Baroda, Chhotaudepur forest division, Pavagadh, Panchmahals; South Gujarat : Broach, Rajpipla, Surat, Hajira, Dumas, Vyara, Bulsar, Dharampur, Sanjan etc.

The plant collection from different parts of Gujarat is deposited in the herbarium of (i) Botanical Survey of India, Poona, (ii) Blatter Herbarium, Bombay, (iii) M. S. University of Baroda, Baroda, (iv) Sardar Patel University, Vallabh Vidyanagar, (v) Gujarat College, Ahmedabad, (vi) Bahudin College, Junagadh, (vii) Ayurvedic College, Jamnagar, (viii) Forest Research Institute, Dehradun (ix) National Botanic Garden, Lucknow and Central National Herbarium, Calcutta.

ARTIFICIAL KEY TO THE FAMILIES

Embryo with 2 cotyledons (rarely one by reduction). Vascular bundles of the stem usually arranged in a single ring; cambium usually present. Leaves usually reticulately veined. Flowers typical 5– to 4–merous. **Class I DICOTYLEDONAE**

Embryo with one cotyledon. Vascular bundles of the stem usually scattered; cambium usually absent. Leaves usually parallel veined*. Flowers typically 3–merous. **Class II MONOCOTYLEDONAE**

CLASS I DICOTYLEDONAE

Petals free; flowers dichlamydeous .. **Subclass I Polypetalae****

Calyx of distinct sepals; ovary superior or immersed in the disk :

* Leaves reticulately veined in Araceae (some), Dioscoreaceae, Smilacaceae and Taccaceae.

** (a) Petals absent in some members of Aizoaceae, Combretaceae, Flacourtiaceae, Lythraceae, Molluginaceae, Opiliaceae Ranunculaceae, Sterculiaceae and Zygophyllaceae.
(b) Petals united in some members of Cucurbitaceae, Mimosaceae and Umbelliferae.

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Torus small or elongated, not expanded .. .. **Group I Thalamiflo**

Torus thickened or expanded into a fleshy disk .. **Group II Disciflo**

Calyx of united sepals; ovary usually included in calyx tu or inferior.. .. .. .. **..Group III Calyciflor**

Petals united.. .. .. **.. Subclass I Gamopetala**

Perianth generally calycine, single or absent.. .. .. **Subclass III Monochlamyde**

Subclass Polypetalae

Group 1 Thalamiflorae

1. Stamens numerous (15 or more) :
   2. Carpels free, usually many but sometimes reduced to one :
      3. Habit terrestrial :
         4. Herbs; if woody twiners, style long, persistent feathery; leaves simple and variously lobed o compound .. ..Ranunculacea
         4. Trees or shrubs, if climbing, style not as above leaves simple, never lobed :
            5. Leaves with parallel nerves and sheathing petiole .. ..Dilleniaceae *
            5. Leaves not as above :
               6. Leaves stipulate; sepals and petals imbricate; thalamus elongate; fruit dry.. Magnoliaceae *
               6. Leaves exstipulate; sepals and petals valvate; thalamus not elongate; fruit fleshy .. .. Annonaceae
      3. Habit aquatic .. . . Nymphaeaceae
   2. Carpels two or more, syncarpous; ovary uni-to multi-locular :
      7. Placentation parietal, sometimes spuriously 2-or more -celled by prolongation of the placentas :

* Very rarely petals are almost free in some Myrsinaceae.

8. Flowers zygomorphic ; ovary seated on a hypogynous disc ; ovary often open at top before seeds ripe .. ..Resedaceae *
8. Flowers actinomorphic ; ovary not as above :
   9. Ovary rasied on a gynophore ; if sessile, leaves compound .. .. Capparaceae
   9. Ovary sessile ; leaves simple, entire or lobed :
      10. Plants usually with yellow or milky sap : flowers bright-yellow or red : petals present :
         11. Herbs : leaves not palmately or digitately divided: sepals 2-3: fruit a capsule, dehiscing by apical pores or valves .. ..Papaveraceae
         11. Trees with palmately or digitately divided leaves ; sepals 5 ; fruit 3-5- valved capsule, valves separating throughout the length.. .. ..Cochlospermaceae *
      10. Plants without sap; petals absent; flowers pale -greenish-yellow .. .. .. Flacourtiaceae
7. Placentation free-central or basal central.. .. Portulacaceae
7. Placentation usually axile sometimes basal :
   12. Stamens monadelphous; anthers 1-2- celled :
      13. Anthers one-celled :
         14. Mostly herbs or shrubs, rarely trees; fruit a dehicent capsule or of indehiscent cocci; carpels 5-many ; pollen rough; leaves mostly simple .. .. Malvaceae
         14. Trees; fruit a capsule or woody berry; carpels 2-5; pollen smooth; leaves compound .. ..Bombacaceae
      13. Anthers 2-celled .. .. Sterculiaceae
   12. Stamens distinct, arising from a raised or contracted torus; anthers 2-celled .. .. Tiliaceae
1. Stamens few (not more than 10) :
   15. Carpels free, 3 or 1; twining or sarmentose, rarely trailing shrubs .. .. Menispermaceae
   15. Carpels united; herbs, shrubs or treess;

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16. Flowers zygomorphic :
    17. Sepals 5, two inner enlarged, petaloid; stamens 8, filaments united for their lower half into a split sheath; placentation axile .. .. Polygalaceae
    17. Sepals 2 or 5; not enlarged; stamens 5 or 6, free or in two bundles; placentation parietal :
        18. Sepals 2, scale-like; stamens 4 or 6, opposite the two petals in two bundles; connective of anthers not produced beyond anther cells.. ..Fumariaceae
        18. Sepals 5, well developed; stamens 5, free; connective of anthers produced beyond anther cells .... Violaceae
16. Flowers actinomorphic :
    19. Placentation parietal :
        20. Leaves scale-like; seeds plumose or winged... .. .. Tamaricaceae
        20. Leaves well developed; seeds not as above :
            21. Petals cruciform; stamens 6, tetradynamous; disc in the form of 4 glands opposite sepals .. .. . Brassicaceae (Cruciferae)
            21. Petals not cruciform; stamens if 6, not tetradynamous; disc never in the form of glands.. .. .. .. Capparaceae
    19. Placentation free-central;
        22. Sepals 2; petals 4-5; leaves fleshy; ovary superior or 1/2 inferior.. .. .. Portulacaceae
        22. Sepals and petals 5 each; leaves not fleshy;ovary superior..Caryophyllaceae
    19. Placentation axile or sometimes basal :
        23. Leaves opposite; sepals imbricate; plants not stellately hairy.. .. .. Elatinaceae
        23. Leaves alternate; sepals valvate; plants stellately hairy :

        24. Stamens monadelphous, antheriferous throughout its length; if stamens united at base only, fruit not prickly .. .. Sterculiaceae
        24. Stamens distinct .. .. Tiliaceae

Group II Disciflorae

1. Placentation parietal; fruit a 3-valved, elongated, pod-like capsule .. .. Moringaceae
1. Placentation axile or axile-pendulous; fruit not as above :
    2. Flowers zygomorphic :
        3. Flowers spurred ; anthers syngenesious; leaves simple, alternate or opposite, at times basal marginal teeth glandular .. .. Balsaminaceae
        3. Flowers not spurred ; anthers free ; leaves ternately compound, leaflet teeth not glandular .. .. Sapindaceae
    2. Flowers actinomorphic :
        4. Ovary syncarpous but styles 5, free or if 1, with 5 linear, stigmatose branches:
            5. Usually woody, twining or sarmentose; fruit winged .. .. .. Malpighiaceae
            5. Plants not twining or sarmentose; fruit not winged :
                6. Leaves simple :
                    7. Perfect stamens 15; glands alternate with petals; capsular lobes 1-seeded, separating septifragally or loculicidally from placentiferous axis .. .. .. Geraniaceae
                    7. Perfect stamens 5; glands minute, opposite the petals; capsule not as above .. .. Linaceae
                6. Leaves compound :
                    8. Trees; fruit a berry .. Averhhoaceae
                    8. Herbs; fruit a capsule .. Oxalidaceae

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4. Ovary syncarpous but styles more or less connate or solitary (seldom carpels free e. g. *Buchanania* in Anacardiaceae):
   9. Plants usually climbing or twining :
      10. Petals absent; flowers urceolate .. .. Opiliaceas
      10. Petals present; flowers not as above :
         11. Inflorescence usually leaf – opposed, often tendrillar; species usually tendril bearing; leaves simple or compound.. .. .. ..Vitaceae
         11. Inflorescence not as above; species etendrillar; leaves simple :
            12. Fruit indehiscent, winged or not; seeds exarillate .. .. Rhamnaceae
            12. Fruit a dehiscent capsule. not winged; seeds arillate.. .. ..Celastraceae
   9. Herbs, shrubs or trees; if twining, plants armed :
      13. Leaves aromatic, gland–dotted.. .. ..Rutaceae
      13. Leaves not gland–dotted :
         14. Stamens monadelphous.. .. .. Meliaceae
         14. Stamens free :
            15. Plants usually with acrid resinous juice; stem bearing resinous passages.. ..Anacardiaceae
            15. Plants not as above :
               16. Inflorescence leaf–opposed.. ..Leeaceae
               16. Inflorescence not as above :
                  17. Leaves simple :
                     18. Plants usually armed with prickles; flowers in axillary fascicles; ovule one in each loculus.. .. ..Rhamnaceae
                     18. Plants unarmed; flowers cymose; ovules 2 or more in each loculus:
                        19. Stamens 3; calyx accrescent .. .. .. Olacaceae
                        19. Stamens 4 – 5; calyx not accrescent.. ..Celastraceae
                  17. Leaves compound :

                     20. Leaves bifoliolate; plants armed.. ..Balanitaceae
                     20. Leaves more than 2 – foliolate; plants unarmed :
                        21. Plants resinous; leaves gland–dotted;..Burseraceae
                        21. Plants not resinous; leaves not gland–dotted :
                           22. Trees; ovule one in each loculus :
                              23. Flowers regular; styles 2-5, connate; ovary lobed; fruit winged, 1–seeded.. .. .. Simaroubaceae
                              23. Flowers irregular; style 1, simple, sometimes divided above; ovary not lobed; fruit 2-3-lobed drupe.. ..Sapindaceae
                           22. Herbs or undershrubs; ovules 2 in each loculus; ovary angled or winged .. ..Zygophyllaceae

Group III Calyciflorae

1. Leaves mostly compound, rarely simple;
   2. Stipules when present, not adnate to the petiole; carpel 1; fruit legume :
      3. Flowers papilionaceous .. .. Papilionaceae
      3. Flowers zygomorphic but not papilionaceous.. .. .. Caesalpiniaceae
      3. Flowers regular, in heads or dense spikes....Mimosaceae
   2. Stipules adnate to the petiole; carpels many, free; fruit an achene .. .. Rosaceae
1. Leaves simple; fruit a capsule, achene, drupe, berry, nut or schizocarpic :
   4. Plants always tendril-bearing :
      5. Flowers unisexual; ovary inferior.. ..Cucurbitaceae
      5. Flowers bisexual; ovary superior .. .. Passifloraceae
   4. Plants etendrillar :
      6. Habit aquatic :
         7. Ovary ½-inferior, 2-celled; style 1; fruit spinous, indehiscent .. .. Trapaceae
         7. Ovary inferior, 4(-2)-celled; style 2 or 4; fruit 4-furrowed or separating into 4 cocci, not spinous .. .. Haloragaceae

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6. Habit terrestrial :
   8. Stamens usually indefinite :
      9. Leaves usually much reduced or O; succulent plants with jointed, prickly phylloclades .. .. Cactaceae
      9. Leaves well developed; plants not as above :
         10. Calyx free from the ovary (i. e. ovary superior) :
            11. Petals present, episepalous and crumpled in bud; margins crisped, erose or fimbriate; leaves not fleshy; ovules on axile placentation; shrubs or trees .. .. Lythraceae
            11. Petals absent; if present not as above, fleshy; ovules basal; herbs or undershrubs.. .. .. .. Aizoaceae
         10. Calyx more or less adnate to the ovary (i. e. ovary inferior) :
            12. Herbs; leaves oblique at base; flowers unisexual; capsule winged.. Begoniaceae
            12. Trees; leaves equal-sided at base; flowers bisexual; fruit a berry or a fibrous drupe, never winged
               13. Leaves alternate, without intramarginal nerves and not glandular punctate :
                  14. Ovary one-celled .. .. Alangiaceae
                  14. Ovary more than one-celled:
                     15. Locules of the ovary superposed; flowers red or orange coloured; fruit a berry with hard, woody rind .. .. Punicaceae
                     15. Ovary 4 – loculate; flowers white; fruit a fibrous drupe .. .. .. Lecythidaceae

               13. Leaves opposite, glandular-punctate, with intra-marginal nerves.. .. .. Myrtaceae
   8. Stamens usually definite, not more than 10 :
      16. Ovary inferior or ½ – inferior :
         17. Usually halophytic species; leaves opposite, stipulate; fruit coriaceous or woody, crowned with or surrounded by persistent calyx teeth; seed germination often viviparous.. .. .. Rhizophoraceae
         17. Not halophytic species; leaves alternate, if opposite then exstipulate; fruit and seed not as above :
            18. Flowers in simple or compound umbels; foliage aromatic; petiole sheathing; fruit of 2 indehiscent, dorsally or laterally compressed mericarps .. .. Apiaceae (Umbelliferae)
            18. Flowers axillary, solitary or in racemes, spikes or cymes :
               19. Herbs :
                  20. Capsule trigonous.. .. Melastomataceae
                  20. Capsule subglobose, linear-cylindric or obcylindric :
                     21. Capsule 2-celled subglobose.. .. .. Vahliaceae
                     21. Capsule 4–5-celled, linear-cylindric or obcylindric.. .. Onagraceae
               19. [illegible] .. .. Combretaceae
      16. Ovary superior :
         22. Soft-wooded trees with latex; leaves palmately fid-to partite, with long, hollow petiole; petals united.. .. .. Caricaceae
         22. Herbs or undershrubs without latex; leaves not as above; petals free :
            23. Flowers usually yellow; placentation parietal.. .. .. Turneraceae
            23. Flowers never pure yellow; placentation axile or basal :

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24. Petals absent; seeds reniform, variously striate rugulose, or muriculate :
    25. Fruit a 3–5-valved capsule or of 2–5, 1-seeded cocci .. .. .. Molluginaceae
    25. Fruit transversely dehiscing; petiole often dilated at base forming pouch....Aizoaceae
24. Petals usually present (rarely minute or absent and then leaves not fleshy); seeds not reniform, smooth .. .. Lythraceae

Subclass II Gamopetalae

1. Ovary completely inferior or ½ – inferior :
    2. Inflorescence an involucrate head; calyx absent or of variously modified pappus; anthers united in a ring around the style; ovary 1-celled.. ..Asteraceae (Compositae)
    2. Inflorescence various, but not as above; calyx usually present; anthers free or connivent in a ring around the style; ovary 2– or more-celled :
        3. Leaves opposite; stipules inter– or intra-petiolar .. ..Rubiaceae
        3. Leaves alternate, exstipulate :
            4. Stigma indusiate; ovary 2-celled with 1–2 ovules in each cell.. .. .. ..Goodeniaceae
            4. Stigma not indusiate; ovary 2–5-celled; ovules many in each loculus :
                5. Corolla actinomorphic or subzygomorphic; anthers free; ovary ½-inferior or completely inferior .. ..Campanulaceae
                5. Corolla distinctly 2-lipped; anthers connivent into a ring; 2 or all anthers penicellate; ovary completely inferior.. .. ..Lobeliaceae
1. Ovary superior :
    6. Leafless, non-green root or stem parasites :
        7. Stem parasites.. .. ..Cuscutaceae
        7. Root parasites :
            8. Placentation parietal.. .. ..Orobanchaceae
            8. Placentation axile .. .. ..Scrophulariaceae

6. Plants carnivorous, aquatics or terrestrials in wet lands but always with leaf bladders .. .. Lentibulariaceae
6. Green plants, not parasites or carnivorous :
    9. Seeds boat shaped .. .. .. Plantaginaceae
    9. Seeds not boat shaped :
        10. Carpels more than 2 :
            11. Flowers usually unisexual; stamens inserted on the receptacle .. .. .. Ebenaceae
            11. Flowers bisexual; stamens inserted on the corolla :
                12. Trees, shrubs or woody twiners; style one; ovary 1–celled or 2–8–celled; calyx without stipitate glands:
                    13. Plants with milky juice; leaves not gland–dotted; corolla 4–8-lobed; stamens as many as corolla lobes and opposite to them or 2–3 times as many often with staminodes; ovary 2-8-celled .. .. Sapotaceae
                    13. Plants without milky juice (if latex present, fruit cylindric, curved); leaves gland–dotted; stamens isomerous with and opposite corolla lobes; staminodes absent; ovary one–celled .. .. Myrsinaceae
                12. Herbs or shrubs; styles 5; or if one, then with 5, terminal stigmatose branches; ovary–one celled; calyx often with stipitate glands.. .. ..Plumbaginaceae
        10. Carpels 2 (rarely 3-4 and then plants aquatic):
            14. Plants with milky latex or greenish–yellow sap :
                15. Pollen masses not agglutinated into pollinia; style one; anthers sagittate; stigma hour–glass–shaped or dumbell–shaped.. .. ..Apocynaceae

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15. Pollen masses agglutinated into wax – like masses or pollinia; style usually 2; anthers and stigma not as above :

16. Filaments united; anthers with horny wings .. ..Asclepiadaceae

16. Filaments free; anthers without horny wings .. ..Periplocaceae

14. Plants without milky-latex or greenish-yellow sap :

17. Flowers actinomorphic :

18. Inflorescence usually secund or one-sided cymes :

19. Fruit a capsule; ovules indefinite in each loculus.. .. .. ..Hydrophyllaceae

19. Fruit a drupe, or of four nutlets; ovules definite in each loculus :

20. Herbs or undershrubs; style entire or shortly 2-lobed .. .. Boraginaceae

20. Trees or shrubs; style once forked or styles 2.. .. .. ..Ehretiaceae

18. Inflorescence not as above :

21. Leaves usually alternate :

22. Plants erect or diffuse, but not twining; ovary 2-celled; ovules many in each loculus on swollen placentas .. ..Solanaceae

22. Chiefly twining, at times trailing, diffuse or erect; ovary 2-celled; ovules 2 in each loculus or 4-celled with one ovule in each loculus.. .. ..Convolvulaceae

21. Leaves opposite or at least lower ones opposite :

23. Stamens 2 .. ..Oleaceae

23. Stamens 4-5 :

24. Trees or shrubs; very rarely herbs and then stipules small or reduced to a transverse line :

25. Ovary 1-celled (if 2-celled, plants armed), 1-2 ovulate .. .. Salvadoraceae

25. Ovary 2-celled and plants unarmed; ovules usually many in each cell on axile placentation (rarely placentation parietal and then one-celled ovary) :

26. Plants with lepidote, stellate or glandular tomentum; intraxylary phloem absent from wood.. .. ..Buddlejaceae

26. Plants without such tementum; intraxylary phloem present in wood .. .. Loganiaceae

24. Herbs, seldom undershrubs :

27. Ovary 1-celled :

28. Placentation free central; stamens opposite the petals .. ..Primulaceae

28. Placentation parietal; stamens alternate with petals.. .. ..Gentianaceae

27. Ovary 2-celled; placentation axile..Scrophulariaceae

17. Flowers zygomorphic :

29. Leaves usually compound; if simple, seeds winged; fruit elongated .. .. Bignoniaceae

29. Leaves usually simple; fruit not elongated; seeds not winged :

30. Flowers with conspicuous bracts and bracteoles; bracts seldom absent; stem often with swollen joints.. .. ..Acanthaceae

30. Flowers without bracts and bracteoles or bracts and bracteoles inconspicuous; stem not nodose :

31. Flowers with extra-floral glands at base of pedicels :

32. Placentation axile; fruit a capsule or indehiscent and spinous.. ... ..Pedaliaceae

32. Placentation parietal; fruit with hooked prongs .. ..Martyniaceae

31. Flowers without extra-floral glands at base of pedicels :

33. Ovules 1 or 2 in each cell :

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34. Inflorescence a verticellaster; style gynobasic; plants aromatic.. .. Lamiaceae (Labiatae)
34. Inflorescence not as above; style terminal; plants not aromatic :
35. Plants maritime with pneumatophores; branches prominently nodose or articulate; placentation free central; placentas 4-winged; seed germination viviparous.. .. ..Avicenniaceae
35. Plants not as above; branches not nodose; placentation axile; seed germination after separation from parent plant..Verbenaceae

33. Ovulues many in each loculus :
36. Placentation axile.. ..Scrophulariaceae
36. Placentation parietal.. .. Gesneriaceae

Subclass III Monochlamydeae

1. Ovary superior :
2. Flowers bisexual :
3. Perianth absent .. .. Piperaceae
3. Perianth present :
4. Plants parasitic, leafless; anthers with valvular dehiscence .. .. Lauraceae
4. Plants not parasitic; anthers not as above :
5. Leaves with ochreate stipules .. Polygonaceae
5. Leaves exstipulate :
6. Trees; leaves bipinnatisect .. Proteaceae
6. Herbs, undershrubs, woody stragglers or twining; leaves entire or slightly lobed :
7. Perianth petaloid :
8. Herbs or shrubs or straggling but not twining; flowers in heads, cymes, or umbels; stamens circinately involute in bud; perianth constricted at base forming a perigone, enclosing ovary .. .. Nyctaginaceae

8. Herbaceous twiners; flowers in spikes, racemes or panicles; perianth and stamens not as above .. Basellaceae
7. Perianth not petaloid; if petaloid, bracts and bracteoles scarious :
9. Bracts and bracteoles absent, or if present herbaceous .. Chenopodiaceae
9. Bracts and bracteoles scarious .. .. Amaranthaceae

2. Flowers unisexual or polygamous :
10. Trees or shrubs :
11. Ovary 3-celled .. .. .. Euphorbiaceae
11. Ovary 1-celled :
12. Calyx absent; flowers in erect or pendulous, catkins or spikes :
13. Leaves much reduced, scale-like; stamen 1; ovary 1-celled; ovules 2, basal; fruit 1-seeded, samaroid nuts crowded into woody cone: seeds not hairy .. .. Casuarinaceae
13. Leaves well developed; fruits not as above; stamens 2 or more; ovary 1-celled with 2-4 parietal or basal placentas; fruit a capsule; seeds hairy..Salicaceae
12. Calyx present, 4-8-lobed; inflorescence various, cymose, spike or hypanthodium :
14. Plants with milky juice; anthers inflexed in bud; leaves not oblique at base; fruit commonly multiple .. Moraceae
14. Plants with watery-sap; anthers erect in bud; leaves oblique at base; fruit a smara, nut or drupe .. .. Ulmaceae

10. Herbs :
15. Aquatics; leaves verticillate, dichotomously cleft into filiform, minutely toothed lobes; stamens 20-30 with 2-toothed or truncate connective.. .. ..Ceratophyllaceae

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15. Terrestrials; leaves not as above; stamens definite, if indefinite connective not as above :
16. Ovary 3-celled .. Euphorbiaceae
16. Ovary 1-celled :
17. Leaves exstipulate :
18. Bracts and bracteoles scarious; fruit an utricle .. .. Amaranthaceae
18. Bracts and bracteoles when present not scarious; fruit a berry .. Phytolaccaceae
17. Leaves stipulate :
19. Leaves variously lobed; anthers erect in bud .. .. .. Cannabaceae
19. Leaves entire; anthers inflexed in bud .. Urticaceae

1. Ovary inferior :
20. Parasites, shrubs or trees; flowers actinomorphic; fruit a drupe or berry :
21. Root parasites; flowers unisexual; disc epigynous or perigynous .. .. Santalaceae
21. Stem parasites; twiggy shrubs; flowers bisexual or unisexual; disc absent .. .. Loranthaceae
20. Plants not parasitic; trailing or twining, perennial herbs or shrubs; flowers zygomorphic; fruit a capsule .. .. Aristolochiaceae

Class II Monocotyledoneae

1. Leaves fan-shaped or pinnate, usually very long or very broad, forming a terminal crown, fibrous, long petiolate.. .. .. Arecaceae (Palmae)
1. Leaves not as above :
2. Perianth none, at least in male flowers (if the flowers unisexual) or rudimentary or of scales or bristles not petaloid :

3. Perianth O; flowers subtended by dry, chaffy, usually imbricating bracts (glumes); inflorescence various, of spikelets :
4. Stem obtusely to distinctly trigonous, mostly solid; leaves not ligulate; leaf sheaths not split; fruit a compressed or trigonous nut .. Cyperaceae
4. Stem mostly hollow, cylindrical or flattened; leaves ligulate; leaf sheaths split; fruit a caryopsis .. .. Poaceae (Gramineae)
3. Perianth represented by scales or bristles; if perianth absent, inflorescence not made up of spikelets; flowers not subtended by dry, chaffy bracts (glume or scales) :
5. Plants not submerged or floating :
6. Plants monoecious; male and female flowers on the same axis, male above, females below in spikes; leaves not spinulose :
7. Plants of wet lands; inflorescence subtended by spathaceous bract; plants tuberous .. .. Araceae
7. Plants not of wet lands; inflorescence not subtended by spathaceous bracts; plants rhizomatous.. .. ..Typhaceae
6. Plants dioecious; leaves spinulose on margins and keels.. .. .. ..Pandanaceae
5. Plants submerged or floating :
8. Plants floating :
9. Fronds thalloid, leafless .. Lemnaceae
9. Stoloniferous plants; leaves radical, obovate-cuneate .. .. Araceae
8. Plants submerged :
10. Perianth absent or of 1-3-scales; anthers 2- or 1-celled; carpels 1-9;
11. Stigma large, peltate deflexed; fresh water plants .. .. Zannichelliaceae
11. Stigma not as above; maritime plants .. .. Ruppiaceae

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10. Perianth present, 2- lipped; anthers 1-4-loculate; carpel solitary.. ..Najadaceae

2. Perianth present, usually of 2-series, at least the inner petaloid, not of bristles or scales :

12. Ovary superior :

13. Plants aquatic :

14. Perianth composed of calyx and corolla. 3 + 3 :

15. Inflorescence subtended by spathe like bract.. .. .. ..Pontederiaceae

15. Inflorescence not as above :

16. Plants laticiferous; inflorescence umbellate; fruit a follicle .. .. Butomaceae

16. Plants not laticiferous; inflorescence in close whorls; fruit an achene .. .. Alismataceae

14. Perianth absent, but sepal-like appendages on the stamens.. ...Potamogetonaceae

14. Perianth one-whorled, corolla-like .. .. Aponogetonaceae

13. Plants terrestrial :

17. Plants climbing or twining :

18. Flowers unisexual, umbellate; anthers one-celled; leaves 3-5 nerved, with reticulate venation; plants often with tendril like petioles and prickly stems and branches .. .. Smilacaceae

18. Flowers bisexual, in racemes; anthers 2-celled; leaves parallel veined or sometimes branches reduced to cladodes; plants not as above .. .. Liliaceae

17. Plants not as above :

19. Flowers in terminal, solitary compact head; leaves radical.. ..Eriocaulaceae

19. Flowers and leaves not as above :

20. Grass-like herbs; perianth sepaloid .. .. Juncaceae

20. Plants not grass-like; perianth petaloid :

21. Plants usually very xerophytic; leaves mostly fibrous and thick in a dense tuft at the base of apex of the stem; flowers mostly in large panicles .. ..Agavaceae

21. Plants not as above :

22. Outer segment of perianth calyx-like and different from the inner corolla segment : flowers actinomorphic or zygomorphic; stamens 6 or 3.. Commelinaceae

22. Outer and inner segments of perianth essentially alike, petaloid .. .. Liliaceae

12. Ovary inferior :

23. Plants usually very xerophytic; leaves mostly fibrous and thick or fleshy, in dense tuft at the base or apex of stem; flowers mostly in large panicles.. .. ..Agavaceae

23. Plants and inflorescence not as above :

24. Flowers regular (rarely irregular) and then stamen 3 or more; no petaloid staminodia :

25. Submerged herbs.. ..Hydrocharitaceae

25. Terrestrials :

26. Plants twining; flowers unisexual; capsule winged or not, but seeds winged; leaves simple or compound, but reticulately veined .. ..Dioscoreaceae

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26. Plants not twining; flowers bisexual; fruit and seeds not winged; leaves parallel veined: if reticulate leaves much lobed :
27. Stem false, composed of convolute leaf sheaths.. .. ..Musaceae
27. Stem never as above :
28. Leaves entire parallel veined; flowers white, pink, rose-coloured or yellow, umbellate or racemose; placentation axile :
29. Inflorescence racemose, rarely solitary; flowers invariably bright – to golden yellow.. ..Hypoxidaceae
29. Inflorescence umbellate; flowers never yellow.. .. ..Amaryllidaceae
28. Leaves 30–45 cm in diameter, long petiolate, variously lobed, reticulately veined; flowers umbellate,lurid-green or greenish-yellow; placentation parietal .. ..Taccaceae

24. Flowers strongly zygomorphic; fertile stamens 1–2, at times only ½ anther fertile, the other becoming petaloid staminodia and more conspicuous than the perianth :
30. Corolla spurred; ovary spirally twisted; gynostemium typical; pollen often agglutinated into pollinia; epiphytic or terrestrial plants.. .. ..Orchidaceae
30. Corolla not spurred; ovary not twisted; gynostemium absent; pollinia absent; plants terrestrial :
31. ½ stamen fertile.. .. ..Cannaceae
31. 1 stamen fertile.. .. ..Zingiberaceae

RANUNCULACEAE

Key to genera

1. Woody climbers; leaves compound (seldom simple), opposite; petals absent; fruit an etario of achenes; style persistent, feathery.. ..*Clematis*
1. Herbs; leaves simple, entire or variously divided, alternate; petals present; fruit an etario of follicles or a head of achenes; style not as above :
2. Flowers regular; sepals not spurred; petals glandular–scaly or pitted at base; fruit a head of achenes.. .. .. ..*Ranunculus*
2. Flowers zygomorphic; posterior petal spurred; petals not glandular at base; fruit an etario of follicles.. .. .. *Delphinium*

CLEMATIS L.

Key to species

1. Flowers more than 2.5 cm across.. .. ..*C. triloba*
1. Flowers less than 2.5 cm across :
2. Flowers 1–1.5 cm across; connective not prolonged beyond anthers... .. ..*C. gouriana*
2. Flowers 1.5-2.5 cm across ; connective prolonged beyond the anthers .. .. ..*C. hedysarifolia*

Clematis gouriana Roxb. ex DC. Syst. 1:138. 1818; FBI 1 : 4; C 1:2; WI 2:231; S 1.

Extensive, glabrous climbers. Leaflets 3–7, 3–8 × 1–4.5 cm, ovate or ovate–elliptic, sparsely hairy beneath. Flowers white or greenish–yellow, fragrant, in 5–8 cm long panicles. Achenes 0·2–0·4 cm long, ovoid, compressed, rufous-hairy.

Dangs (Malegaon-Saputara); rare. (MARUVEL)

FLS : Nov.–Dec. *FRS* : Dec.–Feb.

Clematis hedysarifolia DC. Syst. 1:148. 1818; FBI 1:4; C1:3; S2.

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An extensive, glabrous climber. Leaflets 4–10 × 2–4 cm, ovate, obovate or ovate-elliptic, glabrous. Flowers white or creamy-yellow, in axillary panicles. Achenes 0·2-0·3 cm long, ovoid, compressed, densely hairy.

In deciduous forests; not common. (MORVEL)
FLS : Sep.–Oct. *FRS* : Nov.–Dec.

Clematis triloba Heyne ex Roth, Nov. Pl. Sp. 251. 1821; FBI 1:3; C 1:2; WI 2:231; S & J 1.

Extensive, glabrous climbers. Leaflets 3, 1·5–5·2 × 0·9–3·3 cm, ovate, glabrous. Flowers white, mildly fragrant, in 8–12 cm long, terminal and axillary panicles. Achenes ovoid, compressed, densely silky-hairy.

Dangs (Unai) and Saurashtra; rare (TREKHADIO VELO, MORVEL)
FLS : Oct.–Nov. *FRS* : Dec.–Mar.

DELPHINIUM L.

Delphinium ajacis L. Sp. Pl. 539. 1753; Bailey 398; WI 3:31. f. 16.

Erect, 30–70 cm tall, sparingly hairy herbs. Leaves radical and cauline, all pinnatisect, each segment 1–4 cm long, narrowly linear. Flowers various coloured, axillary, solitary and in 15-20 cm long, terminal racemes. Follicles 1·5–2 cm long, ovoid, hairy. Seeds numerous, minute, black.

Ornamental.
FLS & FRS : Dec.–Mar.

RANUNCULUS L.

Ranunculus sceleratus L. Sp. Pl. 551. 1753; FBI 1:19; C 1:5; WI 8: 364. f. 136.

Stout, erect, 25–40 cm tall herbs. Leaves 1·7–3.5 × 1–3 cm, radical and cauline, broadly ovate, reniform or nearly orbicular, glabrous, tripartite. Flowers yellow or white. Achenes minute, black, glabrous, in 0·3–0·5 cm long, cylindric heads.

North Gujarat (in Sabarmati river beds at Ahmedabad, Prantij and Mahudi) and South Gujarat (in Narmada river bed at Broach and Rajpipla).

FLS & FRS : Jan.–Apr.

DILLENIACEAE
DILLENIA L.

Dillenia pentagyna Roxb. Pl. Cor. 1:21. t. 20. 1795; FBI 1:30; C 1:7; WI 3:65. f. 66; S 2.

4–8 m tall, deciduous trees, with light-brown, rough bark. Leaves 45–90 × 25–45 cm or more, oblong-lanceolate, crowded at ends of branches, nearly glabrous, distantly serrate, petiolate. Flowers 1·7–2 cm across, yellow, showy, fascicled on leafless branches. Fruits 1.5–2 cm across, orange, more or less spherical, of five follicles. Seeds brown, smooth, elliptic or oblong.

So far in Dangs and Chhotaudepur forests; rare (KARMAL);
FLS : Apr.–May. *FRS* : May–June.

MAGNOLIACEAE
MICHELIA L.

Michelia champaca L. Sp. Pl. 536. 1753; FBI 1:42; C 1:8; WI 6.370. f. 136 & Pl. 12; S & J 7; S 2.

Evergreen trees with greyish-brown, rough bark. Leaves 7–22 × 3·5–7·5 cm, elliptic-oblong or elliptic-lanceolate, coriaceous, glabrous or finely hairy beneath, shortly petiolate. Flowers 3·5–5 cm across, bright-yellow, fragrant, axillary, solitary. Follicles 1.5–1.8 × 1–1.5 cm, oblong, grey, with brown spots Seeds 0.3–0.4 cm long, angular, brown, shining.

Ornamental. (CHAMPO, SONERI CHAMPO;)
FLS : Apr.–Aug. *FRS* : May–Aug.

ANNONACEAE
Key to genera

1. Trees; peduncle not hooked :

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2. Deciduous trees, flowers reddish-brown or purple within; petals of inner whorl saccate; fruit hairy.. .. ..*Miliusa*

2. Evergreen trees; flowers greenish-yellow to creamy-yellow; petals not saccate; fruit glabrous :

3. Flowers greenish-yellow; petals membranous, two seriate, linear to linear-lanceolate or ovate, wavy; fruit an etaerio of berries.. .. ..*Polyalthia*

3. Flowers creamy-yellow; petals two seriate, those of inner series minute or absent, those of outer series fleshy, ovate-triangular, each petal at the base with a concavity; fruit a syncarp.. ... ..*Annona*

1. Climbing shrubs; peduncle hooked.. .. ..*Artabotrys*

ANNONA L.

Key to species

1. Fruit tubercled, of loosely cohering pistils that separate and fall apart.. .. .. ..*A. squamosa*

1. Fruit smooth, with solid exterior; pistils marked by depressions .. .. *A. reticulata*

Annona reticulata L. Sp. Pl. 537. 1753; FBI 1:78; C 1:15; WI 1:80. Pl. 15 (2); Bailey 419; Bor 44; S & J 7.

Trees. 3-5 m tall, with spreading branches. Leaves 5-17 × 1.7-3.5 cm, ovate-lanceolate, glabrous, minutely pellucid-punctate, petiolate. Flowers 2-4, on lateral, glabrous pedicels. Fruits 10-15 cm across, yellowish-brown, sub-globose or heart-shaped.

Planted. (RAMPHAL)

FLS : Sept.-Feb. *FRS* : Dec.-May.

Annona squamosa L. Sp. Pl. 537. 1753; FBI 1:78; C 1:15; WI 1:80. Pl. 15(3); Bailey 419; Bor 44; Ch & O 29: S & J 7.

A deciduous tree, 3-5 m tall, with light-black, rough, longitudinally fissured bark. Leaves 3.5-10 × 1.2-5 cm, glabrous, elliptic-oblong or oblong-lanceolate, rarely obovate, petiolate. Flowers solitary or 2-3-fascicled, axillary or leaf-opposed. Fruits 5-10 cm across, globose or cordate-ovoid, with projecting areoles.

Planted; also naturalized in many parts. (SITAPAHL)

FLS: Apr.-Aug. *FRS* : June-Aug.

ARTABOTRYS R. Br.

Artabotrys hexapetalus (L. f.) Bhandari in Baileya 12:149. 1964. *Annona hexapetala* L. f. Suppl. 270. 1781. *Annona uncinata* Lam. Encycl. 2:127. 1786. *Artabotrys odoratissimus* R. Br. in Bot. Reg. t. 423. 1820; FBI 1:54; C 1:10; WI 1:119. Pl. 17 (2); Bailey 420. *Artabotrys uncinatus* (Lam.) Merr. in Phil. Journ. Sci. Bot. 7:234. 1912.

An evergreen, scandent or sarmentose, bushy shrub. Leaves 5-15 × 2.5-15 cm, dark-green, glabrous, oblong-lanceolate or elliptic-lanceolate, shortly acuminate at apex, tapering at base, petiolate. Flowers dark-green, 2.5-4 cm across, drooping from hooked peduncles. Fruits not seen.

Planted. (NAGCHAMPO, LILOCHAMPO)

FLS: Nearly all round the year.

MILIUSA Lesch. ex A. DC.

Miliusa tomentosa (Roxb.) Sinclair in Gardn. Bull. 14 : 378. 1965; S & J 7. *Uvaria tomentosa* Roxb. Pl. Cor. 1:31. t. 35. 1795. *Saccopetalum tomentosum* Hk. f. & Th. Fl. Ind. 152. 1855; FBI 1:88; C 1:17.

15-20 m tall trees; bark dark-blackish-brown, deeply longitudinally fissured. Leaves 6-15 x 3.5-8 cm, alternate, ovate-oblong, at length glabrescent, petiolate. Flowers 1.8-2.5 cm across, on slender pedicels. Fruits 0.8-1 cm across, subglobose, tomentose, stipitate.

In dry deciduous forest; occasional. (UMPH; UMBHO)

FLS : Mar.-Apr. *FRS* : Apr.-June.

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POLYALTHIA Bl.

1. Flowers fascicled, axillary or on leafless branches ; petals linear, membranous .. .. .. *P. longifolia*

1. Flowers axillary, 1–3 ; petals fleshy, ovate .. *P. cerasoides*

Polyalthia cerasoides (Roxb.) Hk.f. & Bth. ex Hk.f. & Th. in Hk.f. FBI 1:63; 1872; C 1:14; S & J 7. *Uvaria cerasoides* Roxb. Pl. Cor. 1:30. t. 33. 1795.

Small trees, with light-grey bark. Leaves 7·5–15.5×2·5-5 cm, oblong-lanceolate, glabrous or sparsely hairy beneath, petiolate. Fruit 0.8–1 cm long, ovoid, apiculate, shortly stalked.

Saurashtra (Barda Mountain), probably planted. (UM, UMDA NU ZAD)

FLS : Mar.

Polyalthia longifolia (Sonn.) Thw. Enum. Pl. Zeyl. 398. 1864; FBI 1:62; C 1:13; Bor 44; Ch & O 29; S & J 7; WI 8 : 187. f. 69. *Uvaria longifolia* Sonn. Voy. Ind. Orient. 2 : 233. t. 131. 1782.

5–10 m tall trees; bark light-blackish-brown. Leaves 7.5–20×2.5–5 cm, lanceolate, glabrous, petiolate. Fruit 1.3–1.8 cm long, ovate-oblong, glabrous, pale-yellow. Seeds 0.5–0.8 cm long, glabrous, shining.

Planted along roads and in gardens. (ASOPALAV)

FLS : Dec.–June. *FRS* : Apr.–Aug.

MENISPERMACEAE

Key to genera

1. Carpel 1; leaves peltate; anthers connate:
   2. Leaves ovate-rotund, reniform or subreniform; bracts of female flowers foliaceous.. ...*Cissampelos*
   2. Leaves ovate-triangular or deltoid; bracts when present not foliaceous :
      3. Sepals in male flowers 4-8, connate; in female sepal and petal 1.. .. .. ..*Cyclea*
      3. Sepals in male flowers free, 6; sepals and petals in female flowers 3-4.. .. ..*Stephania*

1. Carpels 3 or more; leaves not peltate; anthers free :
   4. Woody twiners with long, pendulous, photosynthetic roots; bark corky; leaves cordate at base; stylar mark on fruits subterminal; seeds reniform .. .. *Tinospora*
   4. Herbaceous twiners without photosynthetic roots; bark not corky; leaves subacute, rounded or subcordate at base; stylar mark on fruit sub-basal; seeds round or oblong :
      5. Inflorescence 20–30 cm long, pendulous panicle; drupes 2–2·5 cm long; leaves rounded or somewhat reniform, seldom ovate.. .. ..*Diploclisia*
      5. Inflorescence in small fascicles or cymose; drupes 0.4–0.6 cm long; leaves ovate-triangular, ovate-deltoid, elliptic-oblong or linear-oblong.. .. ..*Cocculus*

CISSAMPELOS L.

Cissampelos pareira L. Sp. Pl. 1031. 1753; FBI 1:103; C 1:24; WI 2:183; Ch & O 30; S & J 7.

Slender twiners, somewhat woody at base, glabrous but for pubescent younger parts. Leaves 3·4–7×3·4–8.5 cm, alternate, silky-pubescent beneath, minutely mucronate at apex, petiolate. Flowers minute, greenish-yellow, males in 4–10 cm long, axillary panicles, females in 4–15 cm long, pendulous racemes. Drupes 0.4–0.6 cm broad, nearly orbicular or ovoid, glabrescent or hairy.

Throughout on hedges and shrubs and small trees in forests; common. (VENIVEL, KARANDHIU, PAHADVEL, LAGHUPADUVEL)

FLS : July-Sep. *FRS* : Aug.–Oct.

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COCCULUS A. P. De Candolle *Nom. Cons.*

Key to species

1. Sepals hairy .. .. *C hirsutus*

1. Sepals glabrous.. .. .. *C pendulus*

Cocculus hirsutus (L.) Diels in Pfreich. 46:236. 1910; Ch & O 31; S & J 7; S 4. *Menispermum hirsutum* L. Sp. Pl. 341. 1753. *Cocculus villosus* DC. Syst. 1:525. 1818; FBI 1:101; C 1:22; WI 2:258.

Scandent, perennial, dioecious herbs, softly villous in younger parts. Leaves 1.5–7 × 0.7–4.5 cm, alternate, at length glabrous or nearly so. Flowers greenish-yellow, in axillary, cymose clusters. Drupes 0.2—0.4 cm across, transversely rugose, deep-purple when ripe.

Throughout on hedges; also a weed in cultivated fields; common. (VEVDI, VEVTI, VAGVAL, VADHI NO VEVLO, ACHIPAD)

FLS & *FRS* : Nov.–Apr.

Cocculus pendulus (Forst.) Diels in Pfreich. 46:237. f. 78-0. 1910; S & J 7. *Epibaterium pendulum* Forst. Charact. Gen. 108. t. 54. 1776. *Cocculus loeba* DC. Syst. 1:529. 1818; FBI :102: C 1:23.

Twiner, with stem and branches clothed with grey pubescens. Leaves 1.5–4 × 0.9–1.8 cm, petiolate. Flowers greenish-yellow, male in axillary fascicales, female solitary. Drupes ovoid, ridged, compressed; stylar mark basal.

Kutch, Saurashtra and Dangs (UNAI). (ORAD, VALUR, PARWATTI, PARPATTI)

FSS & FRS : Oct.–Dec.

CYCLEA Arn.

Cyclea peltata (Lam.) Hk. f. & Th. in Fl. Ind. 201. 1855; FBI 1:104; C 1:25; S & J 7. *Menispermum peltatum* Lam. Encycl. 4:96. 1797.

Twiner, somewhat woody at base. Leaves 4–18 × 3–13.5 cm, glabrous above, hairy beneath, petiolate. Male inflorescence

6-20 cm long, axillary; female one 3.5–15 cm long, pendulous Drupes lax hairy.

Saurashtra (Barda hills); rare. (KARIPAT, KALEPAT)

DIPLOCLISIA Miers

Diploclisia glaucescens (Bl.) Diels in Pfreich. 46:225. t. 77. 1910; Ch & O 31; S 3. *Cocculus glaucescens* Bl. Bijdr 25. 1825. *Cocculus macrocarpus* W. & A. Prodr. 13. 1834; FBI 1:101; C 1:22.

Extensive twiners, with wrinkled, dark-brown bark. Leaves 5–12×7–15 cm, 5-nerved, mucronate, subpeltately petiolate. Inflorescence 45–60 cm long. Drupes 1.8–2.5 cm long, compressed, obovate-oblong, shortly beaked, red.

Pavagadh; rare. (GENERAL ABUSE)

FLS & FRS : Feb.–Mar.

STEPHANIA Lour.

Stephania japonica (Thunb.) Miers in Ann. Nat. Hist. (Ser. 3) 18 : 14. 1866; Forman in Kew Bull. 1956 : 49. *Menispermum japonicum* Thunb. Fl. Jap. 193. 1784. *Stephania hernandifolia* Walp. Rep. 1:96. 1842; FBI 1 : 103; C 1 : 23; Blatter in Journ. Bombay nat. Hist. Soc. 17:763. 1908.

A slender, twining, glabrous shrub. Leaves 4.5–11 × 3.5–9 cm, peltate, petiolate, glabrous or slightly puberulous on nerves. Flowers minute, nearly sessile, umbellate, forming axillary panicles. Drupes 0.4-0.6 cm across, solitary, subsessile, obovold.

Kutch

FLS : July–Aug.

TINOSPORA Miers

Key to species

1. Plants hairy; leaves 9–17 × 8.5–15.5 cm, densely hairy to villous on abaxial surface; flowers green .. .. *T. sinensis*

1. Plants glabrous; leaves 3.5–10×2.5–8.5 cm, glabrous; flowers yellow or greenish-yellow .. .. *T. cordifolia*

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Tinospora cordifolia (Willd.) Miers ex Hk. f. & Th. Fl. Ind. 184. 1855; FBI 1:97; C 1:20; Ch & O 31; S & J 7. *Menispermum cordifolium* Willd. Sp. Pl. 4:826. 1806.

Extensive, deciduous twiners; bark greyish-white, lenticellate, grooved. Leaves membranous, broadly ovate to ovate-triangular, glabrous, 5–7-veined, petiolate. Racemes 2-7 cm long, axillary or more commonly from leafless branches. Drupes 0·4–0·6 cm across, globose, deep-red, marked with a sub-basal style scar.

Throughout on hedges; common. (GULVEL, GADU, GUDAJ VEL)

FLS : Dec.–May. *FRS* : Jan.–June

Tinospora sinesis (Lour.) Merr. in Sunyatsenia 1:193. 1934 & Trans. Am. Phil. Soc. Philad. 24:158. 1935. *Campylus sinensis* Lour. Fl. Cochinch. 113. 1790. *Menispermum malabaricum* Lam. Encycl. 4:96. 1797. *Tinospora malabarica* (Lam.) Miers in Ann. & Mag. Nat. Hist. Soc. (Ser. II) 7:38. 1851 & Contrib. 3:32. 1864; FBI 1:96; C 1:19.

Extensive, woody, twiners; bark warty, grooved when dry. Leaves 7-nerved, membranous, broadly ovate, petiolate.

In the forests of Dangs and Rajpipla; rare.
FLS & FRS : Not seen.

NYMPHAEACEAE

Key to genera

1. Leaves flat, sagittate or cordate at base, floating on the surface of water; margins not upturned; petiole attached to the lamina somewhat near base; margins toothed; torus not turbinate; carpels syncarpous, not sunken in pits .. .. *Nymphaea*

1. Leaves not as above, raised above the surface of water with upturned margins; petiole attached to the lamina almost in the centre; margins not toothed; torus turbinate; carpels free, sunken in pits .. .. *Nelumbo*

NELUMBO Adans.

Nelumbo nucifera Gaertn. Fruct. 1:73. t. 19. f. 2. 1788; WI 7:7. Pl. 2 (col.) & ff. 4-5. 1966; S & J 7; S 6. *Nelumbium speciosum* Willd. Sp. Pl. 2:1258. 1800; FBI 1:115; C 1:28.

Perennial, rhizomatous herbs. Leaves orbicular, glaucous-green, glabrous, petiolate. Flowers 10–20 cm across, solitary, above water; thalamus 3–6 cm broad fleshy. Fruit 1–1·5 cm long, ovoid, glabrous.

Throughout, abundant in ponds. (VADO KAMALFUL, SURYAKAMAL, KAMAL, MOTUKAMAL)

FLS & FRS : Aug.–Oct.

NYMPHAEA L. *Nom. Cons.*

Key to species

1. Leaves irregulary sharply serrate on margins, lower surface pubescent; calyx 5–10 nerved; anthers not appendaged .. .. *N. pubescens*

1. Leaves entire or distantly few toothed, lower surface glabrous; calyx not nerved: anthers appendaged .. .. *N. stellata*

Nymphaea pubescens Willd. Sp. Pl. 2:1154. 1800. *Nymphaea lotus* (non L. 1753) var. *pubescens* (Willd.) Hk.f. & Th. Fl. Ind. 241. 1855; C 1:27. *Nymphaea nouchali* auct. non Burm. f. 1768; WI 7:71. f. 25; Ch & O 32; S & J 7; S 5.

Floating herbs. Leaves 12–25 cm across, orbicular or reniform, glabrous and often nigro-punctate above, prominently nerved beneath. Flowers solitary, 6–9 cm across, creamy-white or pale-blue. Fruits 3.5–5 cm across, fleshy, globose. Seeds small, ellipsoidal, with transparent aril.

Throughout in ponds, ditches etc. (KAMAL, KUMUDINI, POYANA, KAMALFUL)

FLS : Aug.–Oct. *FRS* : Sep.–Nov.

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Nymphaea stellata Willd. Sp. Pl. 2:1153. 1797; FBI 1:114; C 1: 27; S & J 7.

Perennial, floating herbs. Leaves 8.5–20 × 11–25 cm or more, elliptic–oblong or nearly orbicular, glabrous on both surfaces. Flowers 5-10 cm across, white or pale-blue. Fruits 1–3 cm across, globose. Seeds small, longitudinally striate.

Common throughout, along with the previous species. (KAMAL, KUMUDINI, POYANA)

FLS & FRS : Aug.–Nov.

PAPAVERACEAE

Key to species

1. Herbs with milky latex, not spinous; stigmas united forming a persistent disc; capsule porous dehiscent.. .. .. *Papaver*
1. Herbs with yellow juice, spinous; stigmas 3-6, free, radiating; capsule valvular dehiscent.. .. ..*Argemone*

ARGEMONE L.

Argemone mexicana L. Sp. Pl. 508. 1753; FBI 1:117; C 1:29; WI 1:116; Ch & O 32; S & J 8.

An annual, prickly herb, 30–100 cm tall, suffrutescent at base. Leaves both radical and cauline, former 25–35 × 7–9 cm, latter 5–10 × 2.5–4 cm, bluish–green variegated white, spiny on margins and veins, pinnatifid to pinnatipartite, sessile. Flowers bright–yellow, 3–4 cm across, solitary, terminal. Capsules 2–3.5 cm long, spinous, erect. Seeds numerous, black, globose prominently reticulately veined.

Common throughout, a weed in waste places and cultivated fields. (DARUDI)

FLS & FRS : Nov.–June, at times throughout the year.

PAPAVER L.

Papaver somniferum L. Sp. Pl. 508. 1753; FBI 1:117; WI 7:233; S & J 8.

60–100 cm tall, annual herbs. Leaves 5–13 × 2–4 cm, sessile or very shortly petiolate, elliptic–oblong, pinnatifid, sharply serrate. Flowers 5–10 cm across, white, red, purple or scarlet, terminal, solitary. Capsule 2–3 cm across, round or oblong, glabrous. Seeds white or black, reniform.

An escape in cultivated fields : seen but once in North Gujarat (Kadi). (APHIN)

FLS & FRS : Dec.–Mar.

FUMARIACEAE

FUMARIA L.

Fumaria indica (Haussk.) Pugsley in Journ. Linn. Soc. 44:313. 1919; Maheshwari, Fl. Delhi 56. 1963; S & J 7. *Fumaria vaillantii* Lois. var. *indica* Haussk. in Flora 56:443. 1837. *Fumaria parviflora* W. & A. Prodr. 18. 1834 (non Lam.). *Fumaria parviflora* W. & A. var. *vaillantii* (Lois.) Hk. f. & Th. in Hk. f. FBI 1:128. 1872; C 1:30. *Fumaria vaillantii* Lois. in Desv. Journ. Bot. 2:358. 1809; WI 4:68.

Erect or spreading, 20–40 cm tall herbs. Leaves pinnatisect, 1–2.5 cm long, narrowly linear, Flowers pinkish-purple, 0.5–0.6 cm long, congested in 3–6 cm long, terminal racemes. Fruits ± 0.2 cm broad, apiculate at apex, pale–brown.

Kutch, Saurashtra and North Gujarat (Khedbrahma); a weed in cultivated fields; rare. (PITAPAPDO)

FLS & FRS : Dec.–Jan.

BRASSICACEAE (CRUCIFERAE)

Key to genera

1. Pods dehiscent :
   2. Pod long and narrow, rarely torulose, terete, or compressed; replum broad ;
      3. Calyx saccate :

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4. Flowers pale-to bright-yellow; pods appressed to or spreading from floral axis, 3-6 cm long; seeds in one row; stigmas free or bilobed .. .. *Brassica*
4. Flowers lilac or yellow with purple veins; pods adnate to the floral axis, 1.3-1.5 cm long; seeds two seriate; stigma small, not lobed.. .. . *Eruca*

3. Calyx not saccate :

5. Pods turgid, almost cylindric; seeds round, in two rows and irregularly arranged... .. ..*Rorippa*
5. Pods compressed, narrowly linear; seeds flat, in one row .. .. *Cardamine*

2. Pods short and broad, replum broad or narrow :

6. Calyx saccate; herbs or undershrubs, with white hairs; seeds winged.. .. ..*Farsetia*
6. Calyx not saccate; herbs not with white hairs; seeds not winged :

7. Replum broad; seeds many, compressed, minute .. ..*Cochlearia*
7. Replum narrow; seeds two.. .. ..*Lepidium*

1. Pods didymous or long, but not dehiscent :

8. Racemes short, leaf-opposed; pods didymous, beakless, each part one-seeded; flowers white.. .. ..*Coronopus*
8. Racemes long, - terminal; pods long, turgid, beaked, at times transversely septate within; flowers pale-to bright-purple or violet, seldom white with purple lines....*Raphanus*

BRASSICA L.

Key to species and varieties

1. Flower buds longer than open flowers (except *B. campestris*); leaves on inflorescence axis amplexicaul :

2. Stem tuber round or subcylindric..*B. oleracea* var. *gongylodes*
2. Stem not as above :

3. Seeds 0.2-0.3 cm across, round; leaves subfleshy, obovate or oblong :

4. Leaves broad, concave, arranged in a round, subrotund or subconical head .. *B. oleracea* var. *capitata*
4. Leaves not as above but the inflorescence in bud condition round mass-like .. *B. oleracea* var. *botrytis*

3. Seeds less than 0.2 cm broad, more or less angular; basal leaves lyrately pinnatifid, cauline ones lanceolate to lanceolate-oblong, cordate and amplexicaul at base .. ..*B. campestris* var. *sarson*

1. Flower buds shorter than open flowers; leaves on inflorescence axis not amplexicaul :

5. Pods erect, adnate to inflorescence axis, 0.8-3 cm long, inconspicuously 4-gonous; beak thin, seedless; ovary 5-11-ovulate .. .. *B. nigra*
5. Pods ascending or spreading, away from inflorescence axis, 1.5-10 cm long; beak stout, conical at times as thick as pod and 1-2-seeded; ovary many ovulate (9-15) .. .. *B. juncea*

Brassica campestris L. var. **sarson** Prain in Dept. Land Rec. & Agric. Bengal Bull. 4:24. ff. 5-7. 1898; WI 1:215. Pl. 32 (1); Maheshwari, Fl. Delhi 61.1963. *Brassica campestris* L. subsp. *napus* Hk. f. & T. Anders. in Hk. f. FBI 1:156. 1872; C 1:36 (non *Brassica napus* L.)

60-100 cm tall, erect herbs, with ascending branches. Radical leaves 20-30 × 3-5 cm, cauline ones 3-6 × 1-2 cm. Racemes 20-45 cm long, terminal. Pods 3-4 cm long, linear-cylindric, reticulately veined, glabrous. Seeds minute, yellowish-brown, glabrous.

North Gujarat, a weed in cultivated fields; rare. (SARSAV)

FLS & FRS : Jan.-Mar.

Brassica juncea (L.) Czern. & Coss. ex Coss. in Bull. Soc. Bot. France 6:609. 1859; FBI 1:157; C 1:37; WI 1:217. Pl. 33(3); Bailey 438; S & J 8. *Sinapis juncea* L. Sp. Pl. 668. 1753 (excl. syn Herm.)

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Erect, 50–120 cm tall, hispid herbs. Leaves radical and cauline, former 10–25×4–8 cm, lyrately pinnatifid, cauline ones 3.5–8×2–3.5 cm, oblong-lanceolate. Racemes 10–15 cm long, terminal and axillary. Fruits 2.5–6 cm long, linear. Seeds minutely pitted, rounded, blackish-brown.

Throughout, cultivated or an escape. (RAI)

FLS & FRS : More or less throughout the year, profuse in winter.

Brassica nigra (L.) Koch in Roehl. Deutschl. Fl. (ed. 3) 4:713. 1823–26; FBI 1:156; C 1:36; WI 1:218. Pl. 33(4); S & J 8. *Sinapis nigra* L. Sp. Pl. 2:668. 1753.

60–120 cm tall herbs. Leaves radical and cauline bristly, radical ones 6–10 cm long, lyrately pinnatifid, cauline ones 2.5–4×0.8–1.3 cm, linear-lanceolate, entire, or pinnatifid to pinnatipartite. Racemes 45–60 cm long, terminal. Pods 3–4 cm long, linear, glabrous. Seeds brownish-black, glabrous, minutely punctate.

Throughout, a weed in waste places; not common. (KALIRAI, JANGLIRAI)

FLS & FRS : Throughout the year.

Brassica oleracea L. var. **botrytis** L. Sp. Pl. 667. 1753; WI 1:219. Pl. 34(2); Bailey 436.

Cultivated, throughout. (GOBI, FULEVAR, FULGOBI)

Brassica oleracea L. var. **capitata** L. Sp. Pl. 667. 1753; WI 1:220. Pl. 34(1); Bailey 436.

This is cabbage, extensively cultivated in many parts of Gujarat. (CABBAGE, COBBIJ)

Brassica oleracea L. var. **gongylodes** L. Sp. Pl. 667. 1753; WI 1:221. Pl. 34(1). *Brassica caulorpa* Pasq. Cat. Ort. Bot. Nap. 17; Bailey 436.

Cultivated at some places for the tuberous stem used as a vegetable. (NOL-KOL)

CARDAMINE L.

Cardamine trichocarpa Hochst. ex Rich. Tent. Fl. Abyss. 1:18. 1847; S & J 8; S 7. *Cardamine hirsuta* L. var. *subumbellata* Dalz. in Hk. Journ. Bot. 4:294. 1852. *Cardamine subumbellata* Hk. f. & T. Anders. in Hk.f. FBI 1:138. 1872; C 1:32.

Prostrate or suberect herbs. Leaves 2–5 cm long, pinnately segmented, segments 5–7, ovate or ovate-elliptic, glabrous. Flowers 0.15–0.2 cm across, yellow, in 10–15 cm long racemes. Pods 0.5–1 cm long, linear-lanceolate, compressed, shortly beaked, glabrous. Seeds minute, blackish-brown, glabrous.

Saurashtra and South Gujarat (Dangs, Dharampur), in river beds; not common.

FLS & FRS : Nov.–Feb.

COCHLEARIA L.

Cochlearia cochlearioides (Roth) Sant. & Mahesh. in Journ. Bombay nat. Hist. Soc. 54:804. 1957. *Alyssum cochlearioides* Roth, Nov. Pl. Sp. 322. 1821. *Cochlearia flava* Buch.–Ham. ex Roxb. Hort. Beng. 48. 1814 (nomen) & Fl. Ind. 1:45. 1824; WI 2:260; FBI 1:145.

5–30 cm tall herbs. Radical leaves 2·2–7 × 0·5–2·5 cm, lyrately pinnatifid, petiolate, cauline ones 0·8–2×0·4–0·6 cm, elliptic-oblong or obovate-oblong, entire or pinnatifid, glabrous. Flowers yellow, in 3·5–15 cm long, terminal racemes. Pods ovate-oblong or nearly orbicular, glabrous, shortly beaked. Seeds smooth, glabrous, dark-brown or blackish-brown.

Only in Narmada river bed at Broach, Rajpipla (Kevadia) and Chhotaudepur (Hampheshwar).

FLS & FRS : Dec.–Mar.

CORONOPUS Zinn. *Nom. Cons.*

Coronopus didymus (L.) Sm. Fl. Brit. 2:691. 1800; S & J 8. *Lepidium didymum* L. Syst. 2:433. 1759 & Mant. 92. 1767. *Senebiera pinnatifida* DC. in Mem. Soc. Hist. Nat. Par. 144. f. 9. 1799; C 1:35.

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15–40 cm tall, erect or diffuse herbs. Leaves pinnately dissected, radical ones 5–10 cm long, cauline ones 1–1·5 cm long, segments oblanceolate. Flowers ±0·2 cm across, in 0·8–3 cm long racemes. Pod 0·1–0·2 cm broad, compressed, valves reticulate. Seeds 2, yellowish-brown, reniform, microscopically punctate.

A weed in cultivated fields in Saurashtra (Jamnagar), North Gujarat (Kadi) and Central Gujarat (Vallabh Vidyanagar).

FLS & FRS : Aug.–Oct.

ERUCA Adans.

Eruca sativa Mill. Gard. Dict. ed. 8. no. 1. 1768; FBI 1:158; C 1:33; Bailey 439; WI 3:190. ff. 120-121. *Brassica eruca* L. Sp. Pl. 667. 1753.

15–20 cm tall, erect herbs. Leaves 1·5-4 cm long, lyrately pinnatipartite, glabrous or sparsely hairy, petiolate. Racemes 6–10 cm long, terminal. Pods turgid, glabrous, beaked. Seeds 0.1–0·15 cm broad, brownish-black, smooth, compressed, globose or slightly ovate.

A weed in garden at Ambhata near Dehaj in Broach Taluka. (SARSO)

FLS & FRS : Dec.

FARSETIA Turr.

Farsetia jacquemontii Hk. f. & Th. in Journ. Linn. Soc. 5:148. 1861; FBI 1:140; C 1:33.

60–100 cm tall shrubs or undershrubs, with appressed white hairs. Leaves 1.8–6 × 0.2–0.3 cm, nearly sessile, linear-lanceolate, slightly falcate, appressed-hairy. Flowers light-violet, in 6–15 cm long, terminal racemes. Pods 1.8–2.5 cm long, compressed, linear, appressed-hairy. Seeds brown, winged.

Kutch and Saurashtra; not common. (SHADIO ASALIO, ADABAU ASALIO)

FLS & FRS : July–Sep.

LEPIDUM L.

Lepidium sativum L. Sp. Pl. 644. 1753; FBI 1:159; C 1:37; Bailey 440; WI 6:71; S & J 8.

Slender, erect, 25–30 cm tall herbs. Leaves 1.5–6×0.4–1 cm, glabrous, basal ones pinnatipartite, petiolate, gradually becoming entire, linear and sessile in upper parts. Flowers 0.2–0.3 cm broad, white, in 5–15 cm long, terminal racemes. Pods 0.3–0.5 × 0.2–0.3 cm, broadly elliptic-oblong or ovate-oblong, glabrous, emarginate, compressed, margins winged. Seeds ±0.1 cm long, minute, oblong, reddish-brown, smooth, glabrous.

A weed in cultivated fields during winter; not common. (ASALIO, HALIM, ASELIS)

FLS & FRS : Jan.–Apr.

RAPHANUS L.

Key to species

1. Pods 2.5–10 cm long, ovate-lanceolate, bright-green when fresh, septate within .. .. *R. sativus*
1. Pods 30-40 cm long, linear, dark-purple, not septate within .. .. *R. caudatus*

Raphanus sativus L. Sp. Pl. 669. 1753; FBI 1:166; C 1:37; Schulz in Engler, Pfreich. 70:205. 1919; Bailey 439; WI 8:367. ff. 138-140 & Pl. 10 (col.).

Biennial herbs, 40–70 cm tall, hispidly hairy. Leaves radical and cauline, radical ones 20–40 × 5–8 cm, lyrately pinnatifid, petiolate, cauline ones 2.5–7 × 0.5–2 cm, linear to linear-lanceolate, sessile or subsessile. Racemes 10–20 cm long, terminal. Seeds brown, ellipsoid, reticulately veined, glabrous.

Cultivated or an escape. (MULO)

FLS & FRS : Nov.–Apr.

Raphanus caudatus L. Mant. 95.1767; Schulz in Engler, Pfreich. 70:208. 1919.

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Similar to *R. sativus* but the stem, branch, leaf veins and pod dark-purple. Cultivated. (MOGRI)

FLS & FRS : Nov.-Apr.

RORIPPA Scop.

Rorippa indica (L.) Hiern. in Cat. Afr. Pl. Welw. 1:26. add. & corr. 1896; S 7. *Sisymbrium indicum* L. Mant. 1:93. 1767. *Nasturtium indicum* DC. Syst. 2:199. 1821; FBI 1:134; C 1:31.

10–35 cm tall, trailing or suberect herbs. Leaves pinnatipartite, 6–10 cm long, membranous, terminal lobe largest, gradually becoming smaller towards base, irregularly toothed. Flowers yellow, in 7–30 cm long racemes. Pods 1–1.6 cm long, linear, shortly beaked. Seeds ±0.1 cm across, reddish-brown, smooth, glabrous, spherical or nearly so.

Throughout, a weed in moist ground; not common.

FLS & FRS : Nov.-Feb.

CAPPARACEAE

Key to genera

1. Shrubs, trees or woody climbers or twiners; ovary with a gynophore: fruit a berry or a capsule :
   2. Sepals in one whorl :
      3. Plants twining; leaves simple; flowers greenish-white; sepals connate at base; fruit moniliform .. .. *Maerua*
      3. Trees; leaves compound; fresh flowers creamy—to pale-yellow or with purple tinge, brown when dry; sepals free; fruit not moniliform.. .. ..*Crateva*
   2. Sepals in two whorls :
      4. Trees, shrubs or woody climbers, armed; stamens 6 or more, free; disc absent; berries round, ellipsoid or ovoid, indehiscent .. ..*Capparis*
      4. Unarmed shrubs; stamens 4–6 on androphore; disc tubular, unilateral; berries cylindric, subtorulose, tardily

1. Herbs; ovary sessile, seldom on a gynophore; fruit a capsule .. ..*Cleome*

CADABA Forsk.

Cadaba fruticosa (L.) Druce in Rep. Bot. Exch. Cl. Brit. Isles 3:415. 1932; Ch & O 35; S & J 8. *Cleome fruticosa* L. Sp. Pl. 671. 1753. *Cadaba farinosa* Forsk. Aegypt.-Arab. 68. 1775; FBI 1:173; C 1:45. *Cadaba indica* Lam. Encycl. 1:544. 1785; FBI 1:172; C 1:45.

2–3 m tall shrubs. Leaves 1.8–6.2 × 0.8–1.5 cm, elliptic-oblong, glabrous, petiolate. Flowers dirty-white or creamy-yellow, at times tinged pink, in 2–4.5 cm long, terminal racemes. Fruit 1.5–2.5 × 0.4–0.5 cm, pendulous, olive-green. Seeds many, light-brown, horizontal, embedded in orange pulp.

Throughout in plains in hedges, seldom in the forest undergrowth; not frequent. (BATKANI, KATKIAL, TELI-OHEMKAND).

FLS & FRS : Nov.-June.

CAPPARIS Tourn. ex L.

Key to species

1. Plants leafless; when leaves present minute, caducous; flowers red or scarlet .. .. *C. decidua*
1. Plants leafy; flowers white, creamy-yellow or with purple tinge :
   2. Plants climbing or straggling :
      3. Flowers 0.5–0.8 cm across in umbels; berries 0.6–1.2 cm across .. ..*C. sepiaria*
      3. Flowers 2.5–3.2 cm across, not in umbels; berries 2–2.5 cm across.. .. ..*C. zeylanica*
   2. Plants not climbing or straggling :
      4. Prostrate; leaves orbicular or ovate-oblong; spines hooked; flowers axillary, solitary or 2–3-fascicled :
         5. Leaves fleshy; posterior sepal saccate .. ..*C. cartilaginea*
         5. Leaves membranous; sepals not saccate....*C. spinosa*

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4. Erect, unarmed or minutely armed; leaves obovate, elliptic-obovate or elliptic-oblong; inflorescence a raceme .. .. *C. grandis*

Capparis cartilaginea Decne. in Ann. Sc. Nat. (ser. II.) 3:273. 1835; S & J 8. *Capparis spinosa* L. var. *galeata* Hk. f. & Th. in Hk. f. FBI 1:173. 1872; C 1:47.

Armed shrubs, with smooth, straw-coloured bark. Leaves 2.5–5 × 1–3 cm, fleshy, ovate-oblong or elliptic-oblong, glabrous. Flowers white.

Saurashtra and Kutch, on old walls; rare. (KATAR)

FLS & FRS : Aug.–Sep.

Capparis decidua (Forsk.) Edgew. in Journ. Linn. Soc. 6:174. 1862; Ch & O 35; S & J 8. *Sodada decidua* Forsk. Fl. Aegypt. -Arab. 81. 1775. *Capparis aphylla* Roth, Nov. Pl. Sp. 238. 1821; FBI 1:174; C 1:49; WI 2:67. f. 32; Bor 150.

2–5 m tall, armed, bushy shrubs, with corky, greyish-white, longitudinally fissured bark. Leaves only on young shoots, linear-oblong, spinous-tipped, nearly sessile, glabrous. Flowers red or scarlet, in short corymbs. Fruits 0.8-1.5 cm across, almost spherical, smooth, glabrous, red when ripe.

Common, scattered or subgregarious in scrub forests. (KERDO, KERA)

FLS & FRS : Feb.–Sep.

Capparis grandis L. f. Suppl. 263. 1781; FBI 1:176; C 1:50; S & J 8.

2.5–5 m tall large shrubs or small trees, often with crooked trunk; bark yellowish-brown, longitudinally fissured. Leaves 2.2–8 × 2–6 cm, velvety pubescent, at length glabrous, petiolate. Flowers 1.5–2.3 cm across, white, in corymbs. Fruits 1.4–2.5 cm across, globose, rusty-brown, glabrous. Seeds 2-6.

In dry deciduous forests, sometimes in scrub forests; rare. (THIKARI, DUMRO, DUMREJOZAD)

FLS : Nov.–July. *FRS* : Mar.–June.

Capparis sepiaria L. Syst. Nat. (ed. 10) 2:1071. 1759; FBI 1:177; C 1:51; Ch & O 36; S & J 8; S 9.

Stout, armed shrubs, with brown, rough, longitudinally fissured bark in older parts. Leaves 1.3–4 × 1.5–2.7 cm, ovate-oblong or elliptic-oblong, coriaceous, glabrous. Flowers white, 8–20, pedicellate, in axillary and terminal umbels. Fruits smooth, glabrous, dark-violet-purple or almost black when ripe.

Throughout, on hedges; common in scrub forests and semi arid zones. (KANTHAR, KANTHARO)

FLS & FRS : Feb.–June, seldom in December.

Capparis spinosa L. Sp. Pl. 503. 1753; FBI 1:173; C 1:47; S & J 8.

Armed, nearly glabrous shrubs. Leaves 1·5–3 cm long, orbicular, ovate or obovate, petiolate. Flowers white, axillary, solitary. Berries 2·5–5 cm long, obovate, veined, red when ripe.

Kutch and Saurashtra; not common. (KANTALO KANTHARO)

FLS : Oct.–May.

Capparis zeylanica L. Sp. Pl. (ed. 2) 720. 1762; Ch & O 36; S 9. *Capparis horrida* L. f. Suppl. 264. 1781; FBI 1:178; C 1:51.

A climbing shrub, with hooked spines and reddish-brown tomentum in younger parts. Leaves 2·5–4·5 × 1·8–3·5 cm, ovate, obovate or elliptic-oblong, grey-tomentose beneath, shortly petiolate. Flowers white or creamy, supra-axillary, solitary or 2–3, pedunculate. Fruits ellipsoid or nearly globose, deep-red bright-scarlet, glabrous, smooth.

Throughout (except Kutch); not common.

FLS : Dec.–Mar. *FRS* : Mar.–June.

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CLEOME L.

Key to Species

1. Flowers yellow, or dirty-white; leaves compound :
   2. Androgynophore present; flowers dirty-white..*C. gynandra*
   2. Androgynophore absent; flowers yellow :
      3. Leaflets 3; stamens 6; 10–20 cm tall herbs :
         4. Plants armed; capsule 3–5 cm long, minutely prickly .. .. *C. aspera*
         4. Plants unarmed; capsule 0·8–1 cm long, viscidly hairy .. .. *C. brachycarpa*
      3. Leaflets 3–5; stamens numerous; plants 30 cm or more tall .. .. *C. viscosa*
1. Flowers pale-to bright-rosy or purple; leaves simple or compound :
   5. Leaves simple :
      6. Stamens 6 or less :
         7. Plants hairy; bracts stalked; fruit 6–8 cm long, scabrid; seeds horizontal, grooved .. *C. monophylla*
         7. Plants scabrid; bracts not stalked; fruit 1·8–3 cm long, glabrous, slightly papiliose; seeds granulate .. .. *C. scaposa*
      6. Stamens 10–12 .. .. .. *C. simplicifolia*
   5. Leaves compound :
      8. Stamens less than 10; leaflets 3; seeds not echinate .. .. *C. burmanni*
      8. Stamens 10 or more; leaflets 5–7 (–9); seeds echinate .. .. *C. chelidonii*

Cleome aspera Koenig ex DC. Prodr. 1:241. 1824; FBI 1:169; C 1:41.

10–20 cm tall, minutely prickly herbs. Leaflets 0·5–1·5×0·2–1 cm, ovate-lanceolate, hairy. Flowers 0·6–0·8 cm across, solitary, axillary, culminating into a terminal raceme. Capsule narrowly spindle-shaped or linear-lanceolate, reticulately veined. Seeds brown, subglobose, glabrous, with vertical ribs across, concentric horizontal ones.

North Gujarat (Mansa, Mahudi, Kadi), among grasses; very rare.

FLS & FRS : July - Aug.

Cleome brachycarpa Vahl ex DC. Prodr. 1:240. 1824; FBI 1:169; C 1:40.

10–15 cm tall, glandular-hairy herbs. Leaflets 0.6–1x0.2–0.5 cm, obovate-oblong or oblanceolate. Flowers yellow, 0.3–0.4 cm long. Capsule ovate-lanceolate or oblong, reticulately veined. Seeds minute, smooth.

Kutch and Panchmahals (Tuwa) among grasses; rare.

FLS & FRS : Aug.

Cleome burmanni W. & A. Prodr. 1: 22. 1834; FBI 1:170; C 1:41.

15–20 cm tall herbs, sparsely minutely prickly. Leaflets obovate or elliptic-oblong, glabrous. Flowers purple, axiliary, solitary. Capsule 3.5-4 cm long, cylindric, glabrous, striate. Seeds orange or reddish-brown, with horizontal tuberculate ribs.

Reported from Kutch by J. I. Thaker. (NANDHO BIGHRO; NANI TILAVANI)

FLS & FRS : July-Oct.

Cleome chelidonii L. f. Suppl. 300. 1781; FBI 1:170; C 1:42; S & J 8; S 8

30–60 cm tall, annual, glabrous or sparsely prickly herbs. Leaves compound, lower petiolate, upper gradually becoming sessile; leaflets 0.8–7×0.5–1 cm, obovate-lanceolate or linear-lanceolate. Flowers bright-rosy, 2.2–2.5 cm broad. Capsule 5–10 cm long, linear, glabrous, with parallel, wavy striations. Seeds brownish-black, obliquely reniform, warty.

A weed in moist ground and cultivated fields; rare.

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Cleome gynandra L. Sp. Pl. 671. 1753; Ch & O 34; S & J 8; S 9. *Cleome pentaphylla* L. Sp. Pl. (ed. 2) 938. 1762. *Gynandropsis pentaphylla* (L.) DC. Prodr. 1:238. 1824; FBI 1:171; C 1:42.

Viscidly hairy, 30–60 cm tall herbs. Leaves digitately 3–5-foliolate, lower petiolate, upper gradually becoming sessile; leaflets 3–5.5 × 1.5–2.5 cm, elliptic-obovate or elliptic-lanceolate, sesssile, viscidly pubescent. Racemes 5–8 cm long, terminal. Capsules 4.5–8 cm long, linear-cylindric, viscidly pubescent, minutely beaked. Seeds ±0.1 cm across, depressed-spherical, blackish-brown, with many superficial concentric ribs and numerous, irregular cross ribs.

Throughout, scattered or subgregarious; common. (GHANDHATU)

FLS & FRS : July–Dec.

Cleome monophylla L. Sp. Pl. 672. 1753; FBI 1:168; C 1:38.

30–45 cm tall, erect, hairy herbs. Leaves 2–5 × 0.4–0.6 cm, oblong-lanceolate or ovate-oblong, sparsely hairy. Flowers 0.6–0.8 cm broad, purple. Capsule linear, slightly curved, striate, seldom slightly torulose, beaked. Seeds nearly orbicular, flat, prominently ribbed.

So far found in north Gujarat and Chhotaudepur forest division.

FLS & FRS : July–Nov.

Cleome scaposa DC. Prodr. 1:239. 1824; S & J 8. *Cleome papillosa* Steud. Nomencl. (ed. 2) 1:382. 1840; FBI 1:168; C 1:39.

Scabridly glandular-hairy, erect herbs. Leaves 0.6–2.5 cm long, nearly orbicular or elliptic-ovate, scabridly papillose, petiolate. Flowers rose-coloured. Capsules linear, glabrous. Seeds brownish-black, minute, glabrous.

Saurashtra (Rajkot), from cultivated fields.

FLS & FRS : May–Oct.

Cleome simplicifolia (Camb.) Hk. f. & Th. in Hk. f. FBI 1:169. 1872; C 1:40; S & J 8. *Polanisia simplicifolia* Camb. in Jacq. Voy. Bot. 20. t. 20. 1844.

5–20 cm tall, scabridly hairy, erect herbs. Leaves 1–4.8 × 0.8–2 cm, obovate-oblong or elliptic-oblong, scabrid, Flowers pale-to bright-purple, 0.4–0.5 cm broad. Capsules 1.5–2.5 cm long, spindle-shaped, minutely beaked, glabrous, torulose or subtorulose. Seeds pale-brown, glabrous.

Among grasses; not common.

FLS & FRS : July-Sep.

Cleome viscosa L. Sp. Pl. 672. 1753; FBI 1:170; C 1:41; Ch & O 34; S & J 8; S 8. *Cleome icosandra* L. Sp. Pl. 672. 1753; WI 2:231.

Glandular-pubescent, 30–80 cm tall herbs. Leaves 3–5-foliolate, petiolate; leaflets 1–4 × 0.5–1.8 cm, elliptic-oblong, glabrous or nearly so above, pubescent beneath, sessile or subsessile. Flowers 1–1.5 cm across, axillary, solitary, culminating apparently in termial, lax racemes. Capsules 4–8.5 cm long, cylindrical, viscidly hairy, minutely beaked. Seeds ±0.1 cm across, numerous, dark-brown or reddish-brown, reniform, with distinct cross ribs and faint concentric ribs.

Throughout, common, scattered or subgregarious. (PILITILVAN).

FLS & FRS : Throughout the year.

CRATEVA L.

Key to species

1. Leaflets with fewer than 11 pairs of nerves; rachis upto 10 cm long, with upto 20, rarely 40 flowers .. .. : .. .. *C. adansonii* subsp. *odora*

1. Leaflets with (7-) 10–15 (-22) pairs of nerves; rachis 10–16 cm long, 20–90- flowered .. .. .. *C. nurvala* var. *nurvala*

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Crateva adansonii DC. subsp. **odora** (Buch.-Ham.) Jacobs in Blumea 12(2):198. 1964. *Crateva odora* Buch.-Ham. Trans. Linn. Soc. 15:118. 1827.

This species is very similar to *C. nurvala* var. *nurvala* in general appearance but the diagnostic differences between the two are given in the key. Reported by Thaker et al. (1971) from Chhotaudepur forest division-Mogra.

FLS : Apr.

Crateva nurvala Buch.-Ham. var. **nurvala**. *Crateva nurvala* Buch.-Ham. in Trans. Linn. Soc. 15:121. 1827; WI 2:366. f. 134; Ch & O 36; S & J 8. *Crateva religiosa* non Forst. f. var. *nurvala* (Buch.-Ham.) Hk. f. & Th. in Hk. f. FBI 1:172. 1872; C 1:44.

Unarmed, decideous trees, with ash-coloured bark. Leaves 3- foliolate, long petiolate; leaflets 5-12.5×2-5 cm, lateral ones obovate or obovate-lanceolate, strongly obliquely falcate, middle one elliptic-lanceolate, equilateral. Flowers 2.5-3 cm across, in terminal and lateral racemes. Fruits 2.3-5 cm across, subglobose or ovate-oblong, glabrous, papillose, scarlet or pale-orange.

Throughout, at times planted; not common. (VAYVARNO, VARNO, TRIPANJO ZAD).

FLS & FRS : Feb.-June.

MAERUA Forsk.

Maerua oblongifolia (Forsk.) A. Rich. Tent. Fl. Abyss. 1:32. t. 5. 1847; S & J 8. *Capparis oblongifolia* Forsk. Fl. Aegypt.-Arab. 99.1775. *Niebuhria oblongifolia* DC. Prodr. 1:244. 1824. [*Niebuhria ovalifolia* DC. Prodr. 1:244. 1824.] *Niebuhria arenaria* DC. Prodr. 1:244. 1824. *Maerua ovalifolia* (DC.) Camb. in Jacq. Voy. Bot. 23. t. 24. 1844; C 1:43. *Maerua arenaria* (DC.) Hk. f. & Th. var. *glabra* Hk. f. & Th. in Hk. f. FBI 1:171. 1872; WI 6:216.

An unarmed, glabrous shrub. Leaves 3.5-6×2.3-4.5 cm, entire, glabrous, leathery, petiolate. Flowers 1.5-2.5 cm across, in axillary and terminal corymbs. Fruits 4-5 cm long, glabrous, pendulous. Seeds brown, glabrous, echinate.

Throughout, on hedges. (HEMKAND)

FLS & FRS : Oct.-Feb.

RESEDACEAE

RESEDA L.

Key to species

1. Leaves narrowly linear, upper 3-5-divided.. ..*R. pruinosa*
1. Leaves obovate, upper entire.. .. .. ..*R. aucheri*

Reseda aucheri Boiss. Diagn. (Ser. I) 1:5. 1842; FBI 1:181; C 1:53; Blatter in Journ. Bombay nat. Hist. Soc. 17:764. 1908.

30-40 cm tall, glabrous, slightly papillose or not, perennial herbs. Leaves 2-4 cm long, obovate-oblong, or oblanceolate, glabrous. Flowers creamy-white or pale-yellow, in spiciform racemes. Capsule 0·6-0·8 cm long, oblong-obovoid.

Kutch; rare.

FLS & FRS : Mar.

Reseda pruinosa Del. Fl. Aegypt. Ill. 63. 1812; FBI 1:181; C 1:52; Blatter in Journ. Bombay nat. Hist. Soc. 17:764. 1908.

Very similar to *R. aucheri* Boiss. but differs from the latter in leaf shape and divided upper leaves.

Kutch; rare.

FLS & FRS : Mar.

VIOLACEAE

Key to the genera

1. Leaves linear to narrowly linear-lanceolate, rarely obovate or spathulate; sepals and posterior petals not spurred or only posterior petals slightly spurred; anthers free, not spurred .. ..*Hybanthus*
1. Leaves obovate-oblong or elliptic-oblong; sepals and posterior petals spurred; anthers connate, lower anther-lobes spurred .. ..*Viola*

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HYBANTHUS N. J. Jacq. *Nom. Cons.*

Hybanthus enneaspermus (L.) F. Muell. Frag. Phyt. Aust. 10:81. 1876; WI 5:139. f. 86; Ch & O 33. *Viola enneasperma* L. Sp. Pl. 937. 1753. *Viola suffruticosa* L. Sp. Pl. 937. 1753. *Ionidium enneaspermum* (L.) Vent. Jard. Malm. sub. t. 27. 1803. *Ionidium heterophyllum* Vent. Jard. Malm. sub. t. 27. 1803; C 1:55. *Ionidium suffruticosum* (L.) R. & S. Syst. Veg. 5:394. 1819; FBI 1:185.

Perennial, erect or diffuse, suffruticose herbs, glabrous or nearly so. Leaves 0·4–3·5 × 0·1–0·8 cm, glabrous, sessile. Flowers bright-purple, axillary, solitary. Capsules 0·5–0.6 cm long, ovoid or subglobose, glabrous. Seeds numerous, 0·1–0·15 cm long, pale-yellow or brown, striate.

Throughout (except Kutch), among grasses; not common. *FLS & FRS* : July–Dec.

VIOLA L.

Viola cinerea Boiss. var. *stocksii* (Boiss.) Beck. forma *kathiawarensis* Beck. in Beih. Bot. Centralb. 36:36-37. 1918; S & J 9. *Viola stocksii* Boiss. Fl. Orient. 1:453. 1867 *p. p.*; C 1:54. *Viola cinerea* Hk. f. & Th. in Hk. f. FBI 1:185. 1867 (non Boiss.).

Suberect or diffuse, almost glabrous, suffrutescent herbs. Leaves 2–2.5 cm long, glabrous, minutely toothed. Flowers solitary, axillary, white or purple, long peduncled. Capsule 0.4–0.6 cm long, cylindric, 3–valved, glabrous. Seeds numerous, minute, white, ovate, shining.

So far found in Saurashtra and North Gujarat; rare. (BANAFSHA, ZINKO BANAFSHA)

FLS : July–Sep. *FRS* : Aug.–Oct.

COCHLOSPERMACEAE

COCHLOSPERMUM Kunth *Nom. Cons.*

Cochlospermum religiosum (L.) Alst. Handb. Fl. Ceyl. 6:14. 1931; Steenis in Fl. Males. 4 (2):62. f. 1. 1949; WI 2:261. f. 90. *Bombax religiosum* L. Sp. Pl. 552. 1753. *Bombax gossypium* (non L.) Cav. Diss. Bot. 5:297. t. 156. 1785. *Cochlospermum gossypium* DC. Prodr. 1:527. 1824; FBI 1:190; C 1:56.

Deciduous trees, 13–20 m tall. Leaves 10–27 cm across, broadly ovate, 3–5-lobed, pubescent, long petiolate, lobes acuminate. Flowers bright-yellow, 6.5–8 cm across, in terminal panicles. Capsule 8.5–10 × 4.5–6 cm, broadly ellipsoid or obovate, glabrous, ribbed. Seeds 0.5–0.7 cm across, cochleate, brown, minutely tuberculate, densely silky-brown hairy.

Rare, in deciduous forests of Rajpipla, Chhotaudepur and Panchmahals.

FLS : Jan.–Feb. *FRS* : Mar.–Apr.

FLACOURTIACEAE

Key to the genera

1. Plants thorny; leaves not gland-dotted ; leaves unisexual; fruit a drupe; seeds without aril .. .. .. *Flacourtia*
1. Plants unarmed; leaves gland-dotted; flowers bisexual; fruit a capsule; seeds arillate.. .. ..*Casearia*

CASEARIA Jacq.

Key to species

1. Stipules long, lanceolate or subulate.. .. ...*C. graveolens*
1. Stipules minute, scaly :
   2. Branches, leaves and calyx hairy.. .. ..*C. elliptica*
   2. Branches, leaves and calyx glabrous.. .. ..*C. esculenta*

Casearia elliptica Willd. Sp. Pl. 2:628. 1799; S & J 24. *Casearia tomentosa* Roxb. Fl. Ind. 2:421. 1832; FBI 2:593; C 1:554; WI 2:92.

4.5–8 m tall trees, with rough, grey, longitudinally fissured bark. Leaves 5.5–24 × 2–10 cm, gland-dotted, elliptic-oblong or obovate-oblong, glabrous above, pubescent beneath, entire, serrate or crenate. Flowers greenish-yellow, fascicled, axillary or on leafless branches. Fruit 1–2 cm long, ellipsoidal, glabrous, bright-yellow or orange-coloured, many-seeded.

In deciduous forests: rare. (TONDRUM)

FLS : Feb.–May. *FRS* : Mar.–June.

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Casearia esculenta Roxb. Fl. Ind. 2:422. 1832; FBI 2:592; C 1:553; WI 2:92.

3–5 m tall shrubs or small trees, with pale–yellow, smooth bark. Leaves 4–17×2·2–6.5 cm, elliptic–oblong or ovate–oblong, glabrous, petiolate. Flowers pale–green, in axillary fascicles. Fruit 1.5–1.8 cm long, ellipsoidal or subglobose, orange–coloured, glabrous, many–seeded.

So far in Dangs; rare. (TANDOL)

FLS & FRS : Apr.

Casearia graveolens Dalz. in Hk. Journ. Bot. 4:107. 1852; FBI 2:592; C 1:553; S 101. *Casearia glomerata* Talb. For. Fl. 2:69. 1911 (non Roxb. 1814).

4.5–9 m tall trees, with pale–yellowish–brown, lenticellate bark. Leaves 5.5–30×3–15 cm, broadly elliptic or elliptic–oblong, glabrous, petiolate. Flowers greenish–yellow, fascicled, axillary or on leafless branches. Fruit 1.5–2.5 cm long, ellipsoidal or subglobose, smooth, yellow or orange, many–seeded.

In deciduous forests; not common. (KIRAMBIRA KIRMIRA)

FLS : Feb.–July. *FRS :* Mar.–July.

FLACOURTIA Comm.

Key to species

1. Plants 2–5 m tall; drupe 0.8–1 cm broad .. .. *F. indica*
1. Plants 16–20 m tall; drupe 1.5–2 cm across.. ..*F. montana*

Flacourtia indica (Burm. f.) Merr. Interp. Herb. Amb. 377. 1917; Ch & O 37; S & J 9. *Gmelina indica* Burm. f. Fl. Ind. 132. t. 39. f. 5. 1768. *Flacourtia sepiaria* Roxb. Pl. Cor. 1:48. t. 68. 1795; FBI 1:194; C 1:60; WI 4:44. f. 25. *Flacourtia latifolia* Cooke, Fl. Pres. Bombay 1:56. 1903 & 1:59. 1958 (reprinted).

Deciduous, thorny shrubs or small trees, with light–blackish–brown, rough, lenticellate bark. Leaves 2–11×1–6.7 cm, ovate, elliptic or oblong, serrate or crenate, glabrous, petiolate,

Flowers greenish–yellow, fascicled, in axils or on leafless wood. Fruits glabrous, globose, deep–red or deep–purple. Seeds 0.3–0.4 cm across, obovoid–trigonous, pale–yellowish–brown, pubescent.

Throughout; not common. (GARGUGAL, LODRI).

FLS : Jan.–Mar. *FRS* : Feb.–May.

Flacourtia montana Grah. Cat. Bombay Pl. 10. 1839; FBI 1:192; C 1:58; WI 4:43; Ch & O 37; S 10.

Thorny trees. Leaves 11–20×4–8 cm, ovate, glabrous above, thinly hairy beneath, serrate. Racemes 1.5–2 cm long. Fruits round, scarlet, faintly ribbed.

So far reported from Pavagadh and Dangs (Maiegaon).

FLS : Feb.–Mar. *FRS* : Mar.

POLYGALACEAE

POLYGALA L.

Key to species

1. Seeds strophiolate:
   2. Wings obtuse
      3. Leaves lanceolate to oblong–lanceolate; wings petaloid; capsule distinctly margined.. .. ..*P. persicariaefolia*
      3. Leaves narrowly linear; wings not petaloid but with a median green vein; capsule not margined :
         4. Racemes 0.6–1.5 cm long.. .. ..*P. crioptera*
         4. Racemes 5–15 cm long.. ... ..*P. abyssinica*
   2. Wings acute or subacute :
      5. Racemes 5 – 16 cm long; capsule eciliate.. ..*P. elongata*
      5. Racemes 0.7–1.5 cm long; capsule densely ciliate.. .. ..*P. chinensis*
1. Seeds estrophiolate.. .. ..*P. irregularis*

Polygala abyssinica R. Br. ex Fresen. in Mus. Senk. 2:273. 1837; FBI 1:202; Mukerjee in Bull. bot. Soc. Bengal 12:41. 1961; S & J 9;WI 8:190.

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Perennial, 15–40 cm tall, hairy herbs. Leaves 2.5–6 × 0.2–0.3 cm, glabrous or sparsely hairy. Flowers pale-rose, in terminal, lax racemes. Capsule 0.2–0.25 cm long, oblong, retuse, glabrous or glabrescent, ciliate on margins. Seeds brown, oblong, laxly hairy.

Kutch and Saurashtra among grasses; not common.

FLS & FRS : Aug.–Oct.

Polygala chinensis L. Sp. Pl. 704. 1753; FBI 1:204; C 1:64; Mukerjee 35; S & J 9; WI 8:190. f. 71.

Erect or diffuse, appressed-hairy herbs. Leaves 0.5–4 × 0.2–1.3 cm, linear-oblong, elliptic-oblong or obovate-oblong, sessile or subsessile, glabrous or nearly so. Flowers yellow, few, in short, axillary racemes. Capsule 0.3–0.5 × 0.1–0.3 cm, oblong, glabrous but for ciliate margins. Seeds ellipsoid-oblong, long hairy; strophiole 3-lobed, glabrous, cupular.

Throughout among grasses; common. (PILI BHONYSAN, PIRIPATSAN)

FLS & FRS : July–Sep.

Polygala elongata Klein ex Willd. Sp. Pl. 3:879. 1800; FBI 1:203; C 1:64; WI 8:192.

Appressed-hairy, 25–40 cm tall herbs. Leaves 1.5–2.7 × 0.2–0.5 cm, linear-oblong or obovate-oblong, glabrous above, hairy beneath, sessile or nearly so. Flowers yellow, in terminal or supra-axillary racemes; wings 0.3–0.5 cm long, obliquely ovate or oblong, glabrous or nearly so. Capsule 0.4–0.5 cm long, inequilateral, oblong, retuse, glabrescent. Seeds pyriform, densely long hairy; strophiole 3-lobed, slightly hairy at tip.

Chhotaudepur forest division; rather rare.

FLS & FRS : July–Dec.

Polygala erioptera DC. Prodr. 1:326. 1824; FBI 1:203; C 1:63; Mukerjee 47; Ch & O 38; S & J 9; S 11.

10–35 cm tall, erect or diffuse, appressed-hairy annuals. Leaves 0.6–3 × 0.3–0.6 cm, elliptic-oblong, obovate-oblong or linear, appressed-hairy, sessile or nearly so. Flowers pink to

pale-violet, in axillary or extra-axillary, condensed racemes. Capsule 0.3–0.4 × 0.15–0.2 cm, oblong, emarginate, hairy, ciliate on margins. Seeds densly pilose; strophiole obscurely 3-lobed, with a few hairs.

Throughout; common. (PATSAN, BHONYSAN)

FLS & FRS : Throughout the year.

Polygala irregularis Boiss. Diag. Ser. I. 1:8. 1842; C 1:65.

20–30 cm tall herbs. Leaves 2–3.5 × 0.4–0·6 cm, elliptic-oblong, appressed-hairy, shortly petiolate. Flowers rose-coloured or pale-red, in 5–8 cm long, lax, terminal racemes.

Cooke lists it from Kathiawar (Saurashtra) and Saxton (no. 3273) has collected it from Ahmedabad; extremely rare.

FLS & FRS : Oct.

Polygala persicariaefolia DC. Prodr. 1:326. 1824; FBI 1:202; C 1:63; S & J 9.

Simple or branched, erect, 15–45 cm tall, hairy herbs. Leaves 2.5–5 × 0.6–1.5 cm, glabrous or nearly so, mucronate, ciliate on margins, sessile or subsessile. Flowers rose-coloured, in terminal or extra-axillary racemes. Capsule 0.3–0.4 cm long, elliptic-oblong, emarginate, ciliate on thickened margins. Seeds deep-brown, oblong, densely hairy; strophiole smooth, glabrous, crescentic.

Listed by J. I. Thaker (1926) from Kutch. Santapau and Janardhanan have included it in Saurashtra flora also on the authority of J. I. Thaker (1910).

FLS & FRS : Monsoon.

CARYOPHYLLACEAE

Key to genera

1. Leaves opposite, exstipulate; flowers large, attractive, bright-rose-coloured; sepals united.. ... . *Vaccaria*

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1. Leaves opposite or in false whorls; stipules scarious; flowers minute, shining white or tinged rose or rose-coloured; sepals free :

2. Styles 3-5, free; capsule 3-5-valved .. .. *Spergula*
2. Styles 3, united; capsule 3-valved:

3. Prostrate; sepals keeled.. .. .. .. *Polycarpon*
3. Erect; sepals not keeled .. .. *Polycarpaea*

POLYCARPAEA Lam. *Nom. Cons.*

Key to species

1. Leaves narrowly linear to linear-lanceolate, not arranged in rosette; flowers in irregular cymes .. .. *P. corymbosa*
1. Leaves obovate-spathulate or elliptic-obovate, radical ones in rosette : flowers in spikes at ends of terminal, subumbellate branches .. .. *P. spicata*

Polycarpaea corymbosa (L.) Lam Tabl. Encycl. 2:129. 1791; *FBI 1:245; C 1:70;* Ch & O 38; S & J 9; WI 8:189. *Achyranthes corymbosa* L. Sp. Pl. 205. 1753.

10–30 cm tall herbs. Leaves 0.5–1.8 × 0.1–0.3 cm., sessile, glabrous. Flowers light-pink, at length white, in terminal, paniculate cymes. Capsules minute, oblong-ovoid, 3-valved, brown. Seeds numerous, glabrous, somewhat compressed, reniform, yellowish-brown.

Throughout, a weed in waste places and cultivated fields, scattered or subgregarious; common and abundant.

FLS & FRS : Aug.-Feb.

Polycarpaea spicata W. & A. Nat. Hist. (Ser 1) 3:91. 1839; FBI 1:246; C 1:70; S & J 9.

5–15 cm tall, glabrous herbs. Leaves opposite or whorled 1–2.5 × 0.3-1 cm, subfleshy. Flowers fascicled, arranged in a spike. Capsules 0.3-0.5 cm long. glabrous, 3-valved. Seeds oblong, glabrous, smooth, white or brown.

Kutch and Saurashtra, on sands; not common. (FUL CHHOGARO, VAJRDANTI)

FLS & FRS : Aug.-Dec.

POLYCARPON L.

Polycarpon prostratum (Forsk.) Aschers. & Schweinf. in Oster. Bot. Zeitsch. 39:128. 1889 (in Obs.); Ch & O 39; S & J 9; WI 8:189. *Alsine prostrata* Forsk. Fl. Aeg.-Arab. 207. 1775. *Polycarpon loeflingiae* Bth. & Hk. f. ex Edgew. & Hk. f. in Hk. f. FBI 1:245. 1874; C 1:69 (sphalm. *loeflingii*).

Hairy herbs. Leaves 0.5–1.5 × 0.1–0.5 cm, linear-obovate, obovate-oblong or spathulate, appressed-hairy. Flowers minute, light-pink, numerous, in much branched, terminal cymes. Capsule globose or ovoid, membranous, enclosed in persistent calyx. Seeds numerous, minute, pale-brown, subcylindric or oblong, glabrous, longitudinally ribbed, muricate.

A weed in drying moist ground; not common.

FLS & FRS : Dec.-Feb.

SPERGULA L.

Key to species

1. Seeds granulose or papillose.. .. ..*S. arvensis*
1. Seeds smooth :

2. Wing on seed as broad as seed centre; petals lanceolate.. .. ..*S. fallax*
2. Wing on seed narrower than seed centre; petals ovate, obtuse.. .. ..*S. vernalis*

Spergula arvensis L. Sp. Pl. 440. 1753; FBI 1:243; C 1:69.

Erect, suberect or diffuse, 10–30 cm tall, glabrous or glabrescent herbs. Leaves 1.5–5.5 cm long, linear-subulate, somewhat fleshy. Flowers white, stalked, in terminal, subumbellate cymes.

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Capsules 0.2–0.4 cm broad, ovate or subglobose, glabrous. Seeds many, black or dark-brown, granulose or papillose, minutely winged.

A weed in cultivated fields; abundant in places of occurrence.

FLS & FRS : Oct.–Jan.

Spergula fallax (Lowe) E. H. L. Krause in Sturm. Fl. Deutsch. (ed.2) 19. 1901; Bhatt in Journ. Bombay nat. Hist. Soc. 68(2): 492. 1971. *Arenaria flaccida* Roxb. Fl. Ind. 2:447. 1832 (non Clairv. nec Schleich.). *Spergularia fallax* Lowe in HK. Kew Journ. 8:289. 1856. *Spergula flaccida* (Roxb.) Aschers. in Verh. Bot. Ver. Brand. 30:43. 1889.

Slender annuals. Leaves falsely whorled, fleshy, linear–subulate. Flowers white, in branched cymes. Capsule ovoid–rotund, 3–valved. Seeds winged.

Reported from North Gujarat (Khedbrahma) and Saurashtra (Dwarka).

FLS & FRS : Dec.–Feb.

Spergula vernalis Willd. in Fl. Berol. Prodr. 158. 1787; Bhatt. ibid. 493.

A weed in cultivated fields. Reported from North Gujarat (Naka Kalol in Sabarkantha District) and Central Gujarat (Anand in Kaira district).

FLS & FRS : Dec.–Mar.

Vaccaria pyramidata Medic. Phil. Bot. 1:96. 1789; S & J. 9. *Saponaria vaccaria* L. Sp. Pl. 409. 1753; FBI 1:217; C 1:66.

30–60 cm tall, glabrous, erect herbs. Leaves 1–8.5 × 0.2–1.3 cm, elliptic–lanceolate or oblong–lanceolate, membranous, glabrous, sessile. Flowers pale–to bright–rose–coloured, in terminal, branched cymes. Capsules 0.5–1 × 0.3–0.5 cm, oblong, glabrous, straw coloured. Seeds orbicular, dark–brown, glabrous, granulose.

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A weed in cultivated fields and waste lands; not common (VACCARI).

FLS & FRS : Dec.–Apr.

PORTULACACEAE

Key to genera

1. Herbs; nodal appendages, scarious, scaly or hairy, seldom absent. Flowers solitary or fascicled, surrounded by leaves; ovary half-inferior; styles 2–8–branched; capsule circumscissile .. .. *Portulaca*

1. Shrubs or undershrubs, without nodal appendages; flowers in racemes or panicles; ovary superior; styles 3–branched; capsule valvular, dehiscent.. .. .. *Talinum*

PORTULACA L.

Key to species

1. Nodal appendages absent .. .. *P. oleracea*
1. Nodal appendages hairy :
   2. Leaves opposite, lanceolate or ovate; flowers solitary .. .. *P. quadrifida*
   2. Leaves alternate, linear or cylindric :
      3. Flowers yellow :
         4. Prostrate, tuberous herbs .. .. .. *P. tuberosa*
         4. Erect, non–tuberous.. .. .. .. *P. suffruticosa*
      3. Flowers bright–rose–coloured, white or purple.. .. .. *P. grandiflora*

Portulaca grandiflora Hk. f. Bot. Mag. t. 2885. 1829; Bailey 365; S & J 9; WI 2:221.

Prostrate or procumbent, radially spreading, fleshy, glabrous herbs. Leaves 1.5–3.5 cm long, narrowly linear–lanceolate. Flowers terminal, 3–5–fascicled, 2.5–3 cm broad. Capsul 0.6–0.8 cm long, ovoid or conical, glabrous. Seeds minnte, tuberculate, reniform.

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Ornamental; also an escape. (CHINI-GULAB)

FLS & FRS : Throughout the year.

Portulaca oleracea L. Sp. Pl. 445. 1753; FBI 1 : 246; C 1:72; Ch & O 39; S & J 9; S 13; WI 8 : 219.

Prostrate or diffuse, succulent herbs. Leaves alternate, opposite, subopposite or whorled, obovate, sessile. Flowers yellow, terminal, solitary or fascicled. Capsule 0.6–0.8 cm long, ovate–oblong or conical, glabrous. Seeds many, minute, dark–brown, concentrically granulate or tuberculate striate.

Throughout; common. (MOTILUNI, LAKHA LUNI, GHOL. KUTBO).

FLS & FRS : Throughout the year.

Portulaca quadrifida L. Mant. 1 : 73. 1767; FBI 1 : 247; C 1 : 72; Ch & O 40; S & J 9; S 13; WI 8 : 220.

Prostrate, glabrous herbs, with radially spreading branches. Leaves 0.4–0.6 × 0.2–0.3 cm, sessile, fleshy. Flowers yellow, terminal. Capsule 0.2–0.4 cm long, ovoid or conical. Seeds dark–brown or blackish–brown, minutely tubercled, concentrically horizontally ribbed.

Throughout; common. (ZINI LUNI, PATLUNI, SUNLUNI, KHATI BHAJI).

FLS & FRS : Throughout the year.

Portulaca suffruticosa Wt. in Wall. Cat. 6842. 1828 (nomen) ex W. & A. Prodr. 1:356. 1834; FBI 1:247; C 1:73.

30–40 cm tall, glabrous, suffrutescent herbs. Leaves 0.6–1.3 cm long, cylindric or subcylindric, sessile. Flowers yellow, surrounded by 6–8 bractiform leaves and a ring of brown hairs. Capsule ovoid or conical. Seeds minute, black, tuberculate.

Listed by Saxton & Sedgwick (1918) from Ahmedabad, on the authority of Woodrow.

Portulaca tuberosa Roxb. Hort. Beng. 91. 1814 (nomen) & Fl. Ind. 2:464. 1832; FBI 1:247; C 1:73; S & J 9.

Perennial, fleshy, radially spreading herbs. Leaves 1–2.5 cm long, sessile, linear–oblong. Flowers yellow, solitary, surrounded by 6–8 bractiform leaves and a ring of brown hairs. Capsule ovoid or conical, glabrous, shining. Seeds blackish–brown, granulate or minutely tubercled.

Found in Kutch, Saurashtra and North Gujarat (Idar); not common.

FLS & FRS : Aug.–Dec.

TALINUM Adans.

Talinum portulacifolium (Forsk.) Aschers. & Schweinf. in Bull. Herb. Boiss. 4. Append. 172. 1896; Shah in Journ. Bombay nat. Hist. Soc. 66 : 231. 1969. *Orygia portulacifolia* Forsk. Fl. Aeg.–Arab. 103. 1775. *Portulaca cuneifolium* Vahl. Symb. Bot. 1:33. 1790. *Talinum cuneifolium* (Vahl) Willd. Sp. Pl. 2:864. 1799; FBI 1:247; C 1:73.

Slender, glabrous herbs. Leaves 2.5–5.5 × 1.2–2.5 cm, fleshy, obovate, glabrous. Flowers purple, in panicles. Capsule 0.6–0.8 cm broad, glabrous, crustaceous, round. Seeds reniform, compressed, concentrically ribbed.

Reported from Ahmedabad by Dr. B. S. Vaidya.

TAMARICACEAE

TAMARIX L.

Key to species

1. Stamens 5:
   2. Leaves not auricled... .. .. *T. troupii*
   2. Leaves auricled:
      3. Flowers unisexual, dioecious, in dense, cylindric spikes; leaves not punctate .. .. *T. dioica*
      3. Flowers bisexual, in lax racemose panicles; leaves punctate .. .. *T. aphylla*

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1. Stamens 10:

4. Disk glands separating filaments; axis of plume very long. .. .. *T. ericoides*

4. Disc glands passing into the bases of filaments; plume axis short .. .. *T. stricta*

Tamarix aphylla (L.) Karst. Deutsch. Fl. 641. 1880–1883; S & J 10. *Thuya aphylla* L. Cent. Pl. 1:32. 1775. *Tamarix articulata* Vahl, Symb. Bot. 2:48. t. 32. 1791; FBI 1:249; C 1:75.

4–6 m tall trees, with reddish or dark-purple, rough bark. Leaves minute, reduced to sheath, free part triangular. Flowers pale-to bright-rosy-purple, in 10–15 cm long panicles. Capsule 0.2–0.3 cm long, conical, glabrous.

Kutch, scattered or gregarious.
FLS & FRS : Aug.–Sep.

Tamarix dioica Roxb. Hort. Beng. 22. 1814 (nomen) & Fl. Ind. 2:101. 1832; FBI 1:249; C 1:75; S & J 10.

3–6 m tall trees. Leaves minute, scaly, sheathing. Flowers pale-to bright-rosy-purple, 0.2–0.3 cm across, in 3–5 cm long, terminal spikes. Capsule obolong.

Kutch, Saurashtra, North Gujarat (Talod) and in river bed of Narmada near Broach, on the whole rare. (AÇHHILAIJO PRAS, BHURI PRAS).

FLS & FRS: Apr.–Aug.

Tamarix ericoides Rottl. in Gesel. Naturf. Fr. Berlin Neue Schr. 4:214. 1803; FBI 1:249; C 1:76; S & J 10.

1.5–2.5 m tall, bushy shrubs; bark dark-brown or blackish, rough. Leaves minute, ovate-lanceolate, scaly, sheathing at base. Flowers pale-to bright-rosy, in 8–30 cm long, terminal, branched spikes. Capsules 0.8–1.2 cm long, conical, pale-brown or straw-coloured, glabrous. Seeds 0.5–0.7 cm long, oblong, pilose: hairs pale-white.

In stony river beds, subgregarious; common.
FLS & FRS : Aug.–Mar.

Tamarix stricta Boiss. Diag. (Ser. II) 2:57. 1856; FBI 1:249; C 1:76; S & J 10.

Trees or shrubs. Leaves minute, amplexicaul. Flowers rose-coloured, in terminal, simple or branched spikes. Capsules conical.

Santapau has collected it from Saurashtra-Jamnagar and Bordevi in Girnar.

FLS & FRS : Oct.

Tamarix troupii Hole in Ind. For. 45:247. 1919; S & J 10. *Tamarix gallica* Dyer in Hk. f. FBI 1:248. 1874 (non L.) *Tamarix gallica* Dyer var. *indica* (Willd.) Cooke, Fl. Pres. Bombay 1:87. 1902 & 1:75. 1958 (reprinted).

3–4 m tall shrubs or trees; bark greenish-brown, rough, faintly striate. Leaves 0.1–0.15 cm long. triangular, acuminate at apex, glabrous. Flowers 0.2–0.25 cm broad, minutely pedicellate, pale-to bright rose-coloured, in terminal, 10–20 cm long, paniculate spikes. Capsule 3-valved. 0.25–0.35 cm long, ovoid, glabrous. Seeds ellipsoidal, densely hairy at apex.

Gregarious in Kutch, Saurashtra, North Gujarat and South Gujarat (Surat).

FLS & FRS : Aug.–Mar.

ELATINACEAE

Key to genera

1. Flowers in axillary fascicles or solitary, pentamerous; sepals acute, with a prominent mid rib .. .. .. *Bergia*

1. Flowers solitary, axillary, 2–4-merous; sepals obtuse, veinless .. .. *Elatine*

BERGIA L.

Key to the species

1. Glabrous herbs; stamens 10 .. .. *B. capensis*

1. Glandular-hairy herbs or undershrubs; stamens 5 or 10:

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2. Perennial, woody herbs or undershrubs; leaves opposite or whorled; flowers light pink; stamens 10 .. *B. suffruticosa*

2. Annual herbs; leaves opposite; flowers red; stamens 5 .. .. *B. ammannioides*

Bergia ammannioides Roxb. Hort. Beng. 34. 1834 (nomen) ex Roth, Nov. Pl. Sp. 219. 1821; FBI 1:251; C 1:77; Ch & O 40; S & J 10.

Prostrate, suberect or erect, slender herbs, glandular-hairy. Leaves 1.5–4.5 × 0.5–1.3 cm, sessile or subsessile, oblanceolate or elliptic-oblong, glandular-hairy. Flowers subsessile, in axillary fascicles. Capsule 0.1–0.2 cm long, ovoid, glabrous. Seeds minute, oblong, slightly curved, dark-brown, reticulate.

Throughout; common in moist ground.

FLS & FRS : For the best part of year.

Bergia capensis L. Mant. 2:241. 1771; C 1:78; S & J 10. *Bergia verticillata* Willd. Sp. Pl. 2:770. 1799; FBI 1:252. *Bergia odorata* Roxb. Pl. Cor. 2:22. t. 142. 1798.

Fleshy, glabrous annuals, erect or ascending, rooting at lower nodes. Leaves 1.5–5.5 × 0.7–2 cm, lanceolate, elliptic-lanceolate or oblong-lanceolate, glabrous, minutely serrate. Flowers red, in axillary fascicles. Capsule 0.15–0.2 cm broad, globose, glabrous.

Reported by Thaker J. I. from Kutch (1926) and Saurashtra (1910). (JALJAMBVO)

FLS & FRS : Aug.–Oct.

Bergia suffruticosa (Del.) Fenzl, Denskschr. Bot. Ges. 3:183. 1841; Verdcourt in Fl. Trop. E. Africa 300. 1968. *Lancretia suffruticosa* Del. Fl. d'Egypte 69(213). t. 25/1. 1813. *Bergia odorata* Edgew. Journ. As. Soc. Beng. 7:765. 1838; FBI 1:251 C 1:77; S & J 10 (omne non Roxb.).

Suffruticose, glandular-pubescent in younger parts. Leaves sessile or subsessile, 0.5–3 × 0.2–0.7 cm, linear to elliptic-oblong, glandular-hairy, crenato-serrate. Flowers solitary or 2–8-fascicled. Capsule ±0.2 cm across, ovoid, glabrous. Seeds minute, numerous, shining, dark-brown, slightly curved, reticulate.

Throughout; common. (ROPATRI, LAVARIU, VITHI KHARSAN, GANDHARO-OKHRAD).

FLS & FRS : Throughout the year.

ELATINE L.

Elatine ambigua Wt. in Hk. Bot. Misc. 2:63. Suppl. t. 5. 1831; FBI 1:251; Chohan, Shah & Deshpande in Journ. Bombay nat. Hist. Soc. 64:135–136. 1967.

Prostrate, glabrous herbs, rooting at lower nodes. Leaves 0.2–0.7 × 0.05–0.2 cm, elliptic-oblong, entire. Flowers axillary, solitary, peduncled. Capsule ±0.1 cm across, subglobose, glabrous, slightly 3-lobed. Seeds many, minute, brown, oblong, slightly curved, scalariform-reticulate.

From moist places at Tuwa; rare.

FLS & FRS : Aug.

MALVACEAE

Key to genera

1. Herbs or shrubs.
   2. Fruit indehiscent or a schizocarp of 5 or more cocci separating from the central axis :
      3. Epicalyx absent :
         4. Shrubs or undershrubs, 1–2 m tall; ripe carpels 5 or more, each carpel 2-more-seeded; fruit a carcerule.....*Abutilon*
         4. Herbs or undershrubs, erect or diffuse, 30–70 cm tall; ripe carpels 5-10, each carpel one-seeded; fruit not a carcerule.....*Sida*

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3. Epicalyx present :
   5. Epicalyx foliaceous: flowers in a head .. *Malachra*
   5. Epicalyx not foliaceous; flowers not in a head :
      6. Epicalyx 3 :
         7. Leaves orbicular, palmately veined, entire or lobed: flowers white.. .. .. ..*Malva*
         7. Leaves ovate, ovate-oblong or ovate-lanceolate, pinnately veined: flowers yellow.. .. ..*Malvastrum*
      6. Epicalyx 5 or more :
         8. Leaves deeply 5–9-lobed, with a gland on mid-rib on abaxial surface: epicalyx 5; fruit glochidiate.. .. ..*Urena*
         8. Leaves entire or shallowly 3-5-lobed, without a gland on mid-rib on abaxial surface; epicalyx 5–6 or 8–14: fruit not as above;
            9. Carpels 5; styles twice as many as carpels .. ..*Pavonia*
            9. Carpels more than 5; styles as many as carpels.. .. ..*Althea*

2. Fruit a capsule, dehiscent ;
   10. Epicalyx 3, large, persistent :
      11. Plants grey-tomentose; leaves softly grey-tomentose on abaxial surface; style branches free at end; seeds reniform, not cottony.. .. .. ..*Senra*
      11. Plants not grey-tomentose; leaves on abaxial surface also not as above; style branches united: seeds ovoid or angular, cottony.. .. .. ..*Gossypium*

1. Epicalyx 5 or more (seldom absent in *H. lobatus*), small, deciduous :
   12. Calyx cupular, truncate at apex, 5-toothed; teeth minute.. .. ..*Azanza*
   12. Calyx not as above :

   13. Calyx spathaceous, soon falling off after fertilization .. ..*Abelmoschus*
   13. Calyx not spathaceous, persistent.. .. ..*Hibiscus*

1. Trees :
   14. Flowers bisexual, sulphur-yellow when fresh, with a chocolate-brown or deep-purple spot within at base; fruits not winged; leaves broadly ovate, entire; younger parts peltately scaly .. ..*Thespesia*
   14. Flowers polygamous white or tinged pink; fruit winged due to persistent epicalyx; younger parts not peltately scaly.. .. ..*Kydia*

ABELOMOSCHUS Medic.

Key to species

1. Epicalyx 6 or more, linear :
   2. Mature capsule more than 6 cm long, truncate at base; peduncle very short as compared to the length of capsule; seeds ovoid: epicalyx as long as calyx .. .. *A. esculentus*
   2. Mature capsule 3–6 cm long, ovoid lanceolate, narrow at base; peduncle nearly as long as capsule; epicalyx shorter than calyx .. .. *A. moschatus*

1. Epicalyx foliaceous, ovate-lanceolate, 4–6;
   3. Lobes of the leaf acute :
      4. Epicalyx segments free .. ..*A. manihot*
      4. Epicalyx segments united to the tip and spathaceous in an open flower.. .. ..*A. angulosus*
   3. Lobes of the leaf obtuse .. .. *A. ficulneus*

Abelmoschus angulosus W. & A. Prodr. 53. 1834; S & J 10. *Hibiscus angulosus* Steud. Nomen. (ed. 2) 1:758. 1841; FBI 1:341; C 1:118; Thaker Fl. Barda Mt. 81. 1910 & Pl. Kutch 35. 1926.

Reported by Thaker from Kutch and Saurashtra. This report is the only authority on which it is listed by Santapau in his Flora Saurashtra (1962, p. 11).

FLS & FRS : Monsoon.

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Abelmoschus esculentus (L.) Moench. Method. 617. 1794; S & J 10; S 19. *Hibiscus esculentus* L. Sp. 676. 1753; FBI 1:343; C 1:119; Bailey 664; WI 5:84. ff. 31–32 & Pl. 3.

50–200 cm tall, hispidly hairy undershrubs. Leaves 5–21 × 5.5–32 cm, 3–5-lobed, hispidly-hairy, petiolate. Flowers sulphur yellow with a purple base within, axillary, solitary. Capsule 6–15 cm long, 6–9 angled, hairy. Seeds minutely striate.

Throughout, extensively cultivated; also an escape. (BHINDA, BHINDI).

FLS & FRS : Throughout the year, profuse in monsoon.

Abelmoschus ficulneus (L.) W. & A. Prodr. 53. 1834; S & J 10. *Hibiscus ficulneus* L. Sp. Pl. 695. 1753; FBI 1:340; C 1:117.

30–150 cm tall, strigosely hairy, prickly herbs. Leaves 3–10 × 2.5–7.5 cm., shallowly to deeply palmately 3–5-lobed, reniform or suborbicular, strigosely hairy. Flowers 3–4.5 cm across, pale-white or creamy-yellow, deep-purple at base within, axillary, solitary and in terminal racemes. Capsules 3–5 cm long. ovoid, strigosely hairy, beaked. Seeds globose, black, reniform, faintly horizontally striate, pale-rufous-hairy.

Throughout (except Kutch); occasional.

FLS & FRS : Aug.–Dec.

Abelmoschus manihot (L.) Medic. Malvaceae Fam. 46. 1787; Ch & O 47; S & J 10; S 18. *Hibiscus manihot* L. Sp. Pl. 696. 1753; WI 5:90. f. 53. *Hibiscus tetraphyllus* Roxb. Hort. Beng. 52. 1814 (nomen) & Fl. Ind. 3:271. 1832; FBI 1:341; C 1:118.

Perennial, simple or sparingly branched, strigose and weakly prickly undershrubs. Leaves 4–18 × 3.5–20 cm, shallowly to deeply 5–7-lobed, broadly ovate, scabrid. Flowers 4–6 cm across, yellow with a deep purple or chocolate base within. Capsule 3–6 cm long, 4–5-valved, ovoid-oblong, strigose, stipitate. Seeds globose or reniform, black, horizontally striate, rufous-hairy.

Throughout (except Kutch); occasional. (RAN BHINDI, JANGLI BHINDI).

FLS : Aug.–Nov. *FRS* : Sep.–Jan.

Abelmoschus moschatus Medic. Malvaceae Fam. 46. 1787; S & J 10. *Hibiscus abelmoschus* L. Sp. Pl. 696. 1753; FBI 1:342; WI 5:75. ff. 45–46.

Perennial, 1–2.5 m tall, strigose undershrubs. Leaves 8–13 × 9–19.5 cm, 3–5-lobed, ovate, strigosely hairy. Flowers 8–10 cm across, yellow, axillary, solitary and in terminal racemes. Capsule acuminate, villous. Seeds reniform, faintly horizontally striate, blackish-brown.

So far reported from Rajpipla and Saurashtra. (KHAT-BHINDI).

FLS & FRS : Aug.–Dec.

ABUTILON Tourn. ex. L.

Key to species

1. Flowers 5.5–6 cm across, axillary, solitary or in terminal racemes; carpels 5 .. .. *A. polyandrum*
1. Flowers less than 5 cm across, axillary, solitary or geminate or floral axis forked, each branch bearing a single flower; ripe carpels 8–10 or more:
2. Ripe carpels 8–10 :
3. Floral axis axillary, forked; ripe carpels beaked, hispid .. .. *A. ramosum*
3. Floral axis not as above: ripe carpels truncate, softly villous, not beaked .. .. .. *A. fruticosum*
2. Ripe carpels more than 10:
4. Ripe carpels obtuse, not mucronate .. *A. glaucum*
4. Ripe carpels mucronate:
5. Stem appressed, densely hairy .. *A. indicum*
5. Stem patently long hairy .. .. *A. hirtum*
4. Ripe carpels with two horizontal beaks .. *A. theophrasti*

Scanned by CamScanner

Abutilon fruticosum Guill., Perr. et A. Rich. Fl. Senegamb. Tent. 1:70. 1830; FBI 1:328; C 1:104; S & J 10.

75–100 cm tall, appressed-white-tomentose undershrubs. Leaves 2.7–7.5 × 2.2–6.2 cm, ovate, hairy, petiolate. Flowers yellow, 1.5–2 cm across, axillary, solitary. Capsule subcylindric; ripe carpels 0.7–0.8 cm long. Seeds reniform, dark-brown, minutely stellate-white-hairy.

So far in North Gujarat (Kharaghoda), Saurashtra and Kutch; rare. (ZINI KHAPAT, ZINKI KHAPAT, SANERI DABLIAR).

FLS & FRS : Aug.–Oct.

Abutilon glaucum (Cav.) Sw. Hort. Brit. 54. 1826; Ch & O 45; S & J 10. *Sida glauca* Cav. Icon. 5:8. t. 11. 1791. *Abutilon muticum* G. Don, Gen. Syst. 1:502. 1831; FBI 1:327; C 1:102.

1–1.5 m tall, grey or whitish-velvety-tomentose undershrubs. Leaves 3.5–10.5 cm long and almost as much broad, broadly ovate or suborbicular, petiolate. Flowers 2–4.5 cm across, bright-yellow or tinged red, axillary, solitary or geminate. Fruit 1.3–2.2 cm across, orbicular, depressed at top, villous; ripe carpels 0.8–1 cm broad, reniform, pale-blackish-brown, minutely stellate-hairy.

Throughout (except Bulsar, Dangs and Dharampur); not frequent.

FLS & FRS : Aug.–Dec.

Abutilon hirtum (Lam.) G. Don, Gen. Syst. 1:503. 1831; S & J 10. *Sida hirta* Lam. Encycl. 1:7. 1783. *Abutilon graveolens* W. & A. Prodr. 56. 1834; FBI 1:327; C 1:103.

This plant is listed by Raizada & Vaid (*Ind. For.* 83:643. 1957) from Saurashtra-Okhamandal and this is the only authority of its inclusion in *Flora of Saurashtra* (1962, p. 41) by Santapau.

Abutilon indicum (L.) Sw. Hort. Brit. 54. 1826; FBI 1:326; C 1:102; WI 1:4. Pl. 3(2); Ch & O 45; S & J 10. *Sida indica* L. Cent. Pl. 2:26. 1756 & Sp. Pl. (ed. 2) 964. 1762.

75–200 cm tall, grey-tomentose undershrubs. Leaves 3–16 × 2.5–15 cm, broadly ovate or suborbicular, entire, seldom shallowly 3-lobed, hairy, petiolate. Flowers bright-yellow, 1.8–3 cm across, axillary, solitary. Fruit 1–2.5 cm across, appressed-hairy; ripe carpels 15–20, 0.8–1.2 cm long. Seeds reniform, blackish-brown, minutely pitted and stellate-hairy.

Throughout; common. (KHAPAT, DABALIAR)

FLS & FRS : Throughout the year.

Abutilon polyandrum (Roxb.) Schlecht. in Link, Enum. Hort. Berol. 2:264. 1822; FBI 1:325; C 1:101; WI 1:3; S & J 10. *Sida polyandra* Roxb. Hort. Beng. 50. 1814 (nomen) & Fl. Ind. 3:173. 1832.

1–2 m tall shrubs. Leaves 5.5–21.5 × 3–15.5 cm, broadly ovate or ovate-lanceolate, appressed-stellate-hairy, petiolate. Flowers yellow or orange with purple base within, in terminal racemes. Fruit 1.5–1.8 cm broad, subcylindric; ripe carpels 5, elliptic-oblong, appressed-hairy, mucronate. Seeds reniform, brown, minutely stellate-hairy.

Occasional in Dangs forest; also listed by Santapau (1962) from Saurashtra on the authority of Thaker J. I. (KHAPAT; KHAJVANI)

FLS & FRS : Nov.–Dec.

Abutilon ramosum Guill., Perr. et A. Rich. Fl. Senegamb. Tent. 1:68. 1830; FBI 1:328; C 1:103; S & J 10.

60–150 cm tall undershrubs. Leaves 2–15 × 1.5–11 cm, entire or shallowly 3-lobed, broadly ovate or subrotund, hairy, petiolate. Flowers yellow or orange. Fruit 0.8–1.2 cm across, densely hairy, suborbicular; ripe carpels 0.8–1 cm long, ellipsoidal, acuminate, with a recurved mucro, stellately hispid. Seeds reniform, reddish-brown, minutely stellate-hairy.

In undergrowth of forests or in hedges in Central and North Gujarat and Saurashtra; not frequent.

FLS & FRS : Sept.–Dec.

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Abutilon theophrasti Medic. Malvaceae 28. 1787; S & J 10. *Abutilon avicennae* Gaertn. Fruct. 2:251, t. 135. 1791; Thaker J. I. Pl. Kutch 31. 1926.

45–75 cm tall, softly hairy herbs. Leaves 5–10 × 4–6 cm, suborbicular, velvety-hairy, densely on nerves beneath. Flowers yellow, 1–1.5 cm broad. Fruit 1–1.5 cm long, subcylindric; carpels 12–15, each 3-seeded.

Recorded by Thaker J. I. from Saurashtra (1910) and Kutch. (1926). In Kutch it is found along road sides, on earth bunds or as a garden weed. (NANI KHAPAT, BHONYKANSKI)

FLS & FRS Throughout the year.

ALTHEA L.

Key to species

1. Prostrate herbs; corolla 1.3–2 cm across .. *A. ludwigii*
1. Erect undershrubs; corolla 4–8 cm across .. *A. rosea*

Althea ludwigii L. Mant. 98. 1767; FBI 1:319; C 1:95. Blatter in Journ. Bombay nat. Hist. Soc. 17:764. 1908.

Densely hairy annuals. Leaves 2.5–4 cm across, almost orbicular, deeply 5–7-lobed, petiolate. Flowers axillary, solitary or 2–3-fascicled. Fruit 0.8–1.2 cm across, of 8–9 glabrous, ripe carpels.

Kutch.

FLS & FRS: Mar.–July

Althea rosea (L.) Cav. Diss 2:91. t. 28. f. 1. 1786; FBI 1:319 (in note); C 1:90; WI 1:65; Bailey 658; S & J 10. *Alcea rosea* L. Sp. Pl. 687. 1753.

90–120 cm tall annuals, simple or branched from middle, densely clothed with greenish-yellow, stellate hairs. Leaves 7–12 × 5–14 cm, broadly ovate to suborbicular, stellately hairy, entire or shallowly 5–7-partite, petiolate. Flowers white or bright-rosy-purple, sessile, axillary, solitary, culminating into apparent, terminal racemes at ends of branches. Fruits 1.5–2.5 cm across,

depressed-spherical, densely stellate-tomentose. Seeds 0.4–0.5 cm across, subreniform, brown, minutely stellately hairy, conspicuously ribbed.

Ornamental; also at times an escape.

FLS & FRS: Oct.–June.

AZANZA Alef.

Azanza lampas (Cav.) Alef. in Bot. Zeit. 19:298. 1861; S & J 10. *Hibiscus lampas* Cav. Diss. 3 : 154. t. 56. f. 2. 1787. *Thespesia lampas* Dalz. & Gibs. Bombay Fl. 19. 1861; FBI 1:345; Bor 167. *Thespesia macrophylla* Cooke, Fl. Pres. Bombay 1 : 121. 1904 (non Bl. 1825).

1–2.5 m tall undershrubs. Leaves 8–24 × 17–27 cm, angular or shallowly 3 (5–7)-lobed, broadly ovate or ovate-rhomboid, thinly stellately hairy above, white-tomentose and nigro-punctate beneath, petiolate. Flowers 8–10 cm across, axillary, solitary and in apparent, terminal racemes. Capsule 1.5–3.5 cm, long, ovoid, 4–5-valved, blackish-brown, minutely tuberculate, stout, apiculate. Seeds cuneate, light-black, appressed-hairy, dorsally rounded.

Throughout in shade; not common. (JANGLI BHINDI, NANO PARAS PIPLO)

FLS & FRS : Sep.–Feb.

GOSSYPIUM L.

Key to species

1. Involucral bracts laciniate or pectinate, acuminate :
   2. Capsule mucronate, hairy..... .....*G. stocksii*
   2. Capsule acuminate, glabrous :
      3. Plants 2–3 m tall, glabrous; flowers 4–6 cm across; staminal column long; anthers closely set; filaments equal, short; involucral bracts 2.5–6 × 1–4.5 cm.....*G. barbadense*

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3. Plants upto 1.5 m tall, hairy; flowers 2.5–4 cm across; staminal column short; anthers scattered; filaments unequal; involucral bracts 1–1.8×1.3–2 cm..... .....*G. herbaceum* var. *acerifolium*

1. Involucral bracts entire or minutely dentate.....*G. arboreum*

Gossypium arboreum L. Sp. Pl. 693. 1753; FBI 1:347; C 1:125; Hutchinson, Silow & Stephens, Evol. *Gossypium* 32. t. 4. 1947; S & J 11.

Shrubs or undershrubs, upto 2 m tall. Leaves deeply 5–7–lobed, coriaceous, subglabrous, lobes linear-oblong. Flowers yellow, white or reddish–purple, deep–violet at base within. Capsule 2.2–2.5 cm long, globose or orbicular–oblong, pointed. Seeds 6–8 in each loculus, cottony, floss white, not easily separable.

Planted at some places.

FLS & FRS : Dec. – Mar.

Gossypium barbadense L. Sp. Pl. 693. 1753; FBI 1:347; C 1: 125; Bailey 663; WI 4:173. ff. 81–83; S & J 11.

Slender shrubs, with rough, pale–brown bark. Leaves 4–15 × 5–17 cm, broadly ovate, (2–) 3–5–lobed, almost glabrous, nigro–punctate beneath, petiolate. Flowers yellow, axillary, solitary. Capsule 3–5.5 cm long, reddish–brown, 3–4–valved, valves woody, minutely tubercled. Seeds light–black, reniform, white–cottony.

Native of America; cultivated at some places or as an escape. (VILAYTI KAPAS)

FLS : Nov.–Mar. *FRS* : Dec.–May.

Gossypium herbaceum L. var. **acerifolium** (Guill. & Perr.) Chevalier in Rev. Bot. Appl. Agr. Trop. 19:537. 1939; Hurchinson, Silow & Stephens, Evol. *Gossypium* 36. f. 5. 1949; Ch & O 48. *Gossypium punctatum* Guill. & Perr. var. *acerifolium* Guill. &

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Perr. Fl. Senegal. Tent. 63. 1830. *Gossypium herbaceum* auct. non L.; FBI 1:346; C 1:123; Bailey 663. *Gossypium herbaceum* L. race *wightianum* (Todaro) Hutchinson; WI 4:176. Pl. 12 (col.) & f. 84.

90–150 cm tall shrubs or undershrubs. Leaves 4–7 × 4.5–7 cm, 3–7–lobed, broadly ovate, stellate–hairy, petiolate. Flowers yellow with a purple base within, axillary, solitary or 2–3–fascicled. Capsule 1.5–2.5 cm long, ovoid–conical; valves 3–4, woody, cuspidate. Seeds light–black, reniform, white–cottony.

Cultivated throughout; also an escape. (KAPAS, DESI KAPAS)

FLS & FRS : Oct.–Apr.

Gossypium stocksii Mast. in Hk. f. FBI 1:346. 1874; C 1:123; Hutchinson, Silow & Stephens Evol. *Gossypium* 30. t. 4. 1947; S & J 11.

Prostrate undershrubs, finely pubescent. Leaves 3–5–lobed down to the middle, 2–7 cm across, orbicular, petiolate. Flowers yellow with purple base. Capsule 3–5–valved, valves mucronate. Seeds cuneate, cottony.

Saurashtra, on sandy wastes in vicinity of Dwarka.

FLS & FRS : Oct.–Dec.

HIBISCUS L. nom. cons.

Key to species

1. Flowers white or pale to deep–pink; if red, plants cultivated :

2. Epicalyx absent; seeds glabrous .. .. *H. lobatus*

2. Epicalyx present; seeds cottony:

3. Leaves 4.5–15×2–10 cm, more or less 3–lobed; petals 1.2–2×0.6–0.8 cm. .. .. *H. hirtus*

3. Leaves 1.5–3 × 1–1.7 cm, not lobed; petals 0.3–0.5 × 0.1–0.15 cm .. .. .. *H. ovalifolius*

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1. Flowers yellow, mostly with a deep purple or chocolate-brown base within :
   4. Flowers pendulous; leaves ovate-triangular; capsule winged .. .. *H. vitifolius*
   4. Flowers, leaves and capsules not as above :
      5. Involucral bracts forked or foliaceous :
         6. Stipules lanceolate .. .. *H. furcatus*
         6. Stipules linear .. .. *H. radiatus*
         6. Stipules semicordate, auricled.. ..*H. surattensis*
      5. Involucral bracts entire, not foliaceous :
         7. Involucral bracts much longer than sepals and steilately radiating .. .. .. *H. caesius*
         7. Involucral bracts not as above :
            8. Calyx membranous, enlarged .. *H. trionum*
            8. Calyx not as above :
               9. Seeds cottony .. .. .. *H. palmatus*
               9. Seeds glabrous or hairy but not cottony :
                  10. Involucral bracts connate at base :
                     11. Involucral bracts narrowly linear; seeds minutely stellate-scaly ....*H. lunarifolius*
                     11. Involucral bracts spathulate; seeds villous .. .. *H. panduraeformis*
                     11. Involucral bracts linear, flat; seeds tuberculate .... *H. punctatus*
                  10. Involucral bracts free :
                     12. Plants prickly; calyx lobes prickly, long awned at apex ..*H. cannabinus*
                     12. Plants not prickly; calyx segments ovate-triangular. hairy on margins .. ..*H. sabdariffa*

1. Flowers deep-red or scarlet, if light coloured, petals laciniate :
   13. Corolla entire, erect .. .. *H. rosa-sinensis*
   13. Corolla laciniated, reflexed .. .. .. *H. schizopetalous*

Hibiscus caesius Garcke in. Oestr. Bot. Zeit. 7:850. 1849; C 1:116; S & J 11. *Hibiscus gibsoni* Stocks in Harv. & Sond. Fl. Cap. 2:587. 1862; FBI 1:339.

60–100 cm tall, sparingly patently hairy herbs. Leaves 3–5-lobed, lobes 4–11 × 1–3.5 cm, narrowly or broadly elliptic-lanceolate, hairy, petiolate. Flowers yellow, axillary, solitary, 6–8 cm across. Capsule 1 × 0.8 cm, broadly ovoid or subglobose, shortly apiculate, yellow or brown hairy. Seeds reniform, dark-brown, appressed, short, white-hairy.

In the forest undergrowth or open grasslands in South Gujarat (Rajpipla), Central Gujarat (Vasad), North Gujarat (Modasa, Pahada, Himmatnagar, Sarneshwar) and Saurashtra; not frequent.

FLS & FRS: Aug.–Dec.

Hibiscus cannabinus L. Syst. (ed. 10) 1149. 1759; FBI 1:339; C 1:116; Bailey 665; WI 5:77. Pl. 2. & f. 48; S & J 11.

1–3 m tall, erect, glabrescent or hairy undershrubs. Leaves deeply 3–5-lobed, lobes 2–10×0.4–1.2 cm, narrowly lanceolate, linear-lanceolate or elliptic-lanceolate, glabrous. Flowers 6–7 cm across, pale-yellow with a chocolate base within, axillary, solitary, sessile or subsessile. Capsule 1.2–1.5 cm broad, ovoid, apiculate, reniform, brown, dotted with stellate hairs.

Cultivated at many places for fibres and leaves used by tribals as a substitute for tarmarind. (AMBADI)

FLS & FRS : Aug.–Dec.

Hibiscus furcatus Willd. Enum. Hort. Berol. 736. 1809; FBI 1:335; C 1:112; WI 5:89; Santapau & Shah in Journ. Bombay nat. Hist. Soc. 62:203. 1965.

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45–100 cm tall, softly prickly, hairy undershrubs. Leaves 3–8.5 cm long and almost as much broad, broadly ovate or suborbicular, entire or 3–5-lobed, strigosely-hairy. Flowers 2.5–4 cm across, lemon-yellow with a purple base within, axillary, solitary. Capsule 1-1.5×0 7-1 cm, ovoid, pointed, silky hairy. Seeds reniform or subglobose, brown, with scattered, minute, stellate hairs.

So far found in Dangs Forest; not frequent.

FLS & FRS : July–Oct.

Hibiscus hirtus L. Sp. Pl. 694. 1753; FBI 1:335; C 1:113; S & J 11; S 17.

45–100 cm tall, erect, nearly glabrous herbs, woody at base. Leaves ovate-triangular or ovate-lanceolate, stellately hairy, at length almost glabrous. Flowers 2.5–4 cm across, white, seldom rose coloured, axillary, solitary and in terminal racemes. Capsule 0.8–1.2 cm across, obovoid or subglobose, minutely hairy. Seeds reniform, cottony.

In the forest undergrowth in South Gujarat (Dangs, Rajpipla), North Gujarat (Idar, Vireshwar) and Saurashtra (Girnar and Barda); not common. (BAPORIS)

FLS: Oct.–Mar. *FRS*: Nov.-Mar.

Hibiscus lobatus (Murr.) O. Ktze. Rev. Gen. Pl. 3:19. 1891; Ch & O 46; S & J 11. *Solandra lobata* Murr. in Comm. Goett. 6:21. t. 1. 1785. *Hibiscus solandra* L. Her. Stirp. Nov. 1:103. t. 49. 1786; FBI 1:336; C 1:114.

Simple or branched, 30–75 cm tall, appressed-hairy herbs. Leaves 2–11.5 × 1–8.5 cm, linear, ovate or suboricular, stellate hairy, entire or shallowly, lobed, seldom almost trifoliolate, petiolate. Flowers white, seldom tinged pink or completely rose-coloured, 1.5–2.5 cm across, axillary, solitary and in terminal racemes,

Capsule 0.8–1 cm broad, ovoid, pointed at apex, glabrescent, 5-valved. Seeds subreniform, chocolate-coloured, minutely tubercled.

Throughout, common. (TALI)

FLS & FRS : Aug.–Nov.

Hibiscus lunarifolius Willd. Sp. Pl. 3:811. 1800; FBI 1:338; C 1:115.

Annuals with appressed-stellate and simple hairs. Leaves 7–10 cm broad, nearly orbicular, 3–5-lobed. Flowers axillary, solitary and in 10–15 cm long, terminal racemes. Capsule subglobose, beaked. Seeds reniform, blackish-brown, scattered stellate-scaly.

So far reported from Bulsar and its environs; rare.

FLS & FRS : Oct.–Nov.

Hibiscus ovalifolius (Forsk.) Vahl. Symb. Bot. 1:40. 1790; S & J 11. *Urena ovalifolia* Forsk. Fl. Aegypt.–Arab 124. 1775. *Hibiscus micranthus* L. f. Suppl. 308. 1781; FBI 1:335; C 1:113; S 18.

30–180 cm tall, slender, hairy, suffruticose herbs. Leaves, ovate–oblong, stellate-hairy. Flowers pale–to bright–rosy, axillary, solitary and in terminal racemes. Capsule 0.6–1 cm broad, subglobose or obovoid, 5–valved.

Throughout, common. (CHANAK BHINDO, ADABAU BAPARIS)

FLS & FRS : Aug.–Mar.

Hibiscus palmatus Forsk. Fl. Aegypt.–Arab. 117 & 126. 1775; S & J 11. *Hibiscus intermedius* A. Rich. Tent. Fl. Abyss. 1:58. 1847 (non Belanger 1834); FBI 1:336; C 1:114.

30–60 cm tall, slender, strigosely hairy herbs. Leaves ovate or suborbicular, 3–7–lobed, lobes linear–lanceolate. Flowers yellow with a chocolate–brown base, axillary, solitary. Capsule 0.6–0.8 × 0.5–0.6 cm, slightly obovate–oblong, membranous, hairy, apiculate. Seeds reniform, light–black, minutely stellate hairy.

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So far found in Saurashtra and Kutch; not frequent.

FLS & FRS : Aug.-Nov.

Hibiscus pandurae formis Burm. f. Fl. Ind. 151. t. 49. f. 2. 1768; FBI 1:338; C 1:115.

1-2 m tall, erect, stout, scabridly hairy herbs, hairs seldom irritant. Leaves 3.5–8 × 2.5–7.5 cm, broadly ovate, shallowly 3–5 -lobed, glabrescent above, white- or grey-tomentose beneath. Flowers 5–6.5 cm across, yellow with a deep-purple base within, axillary, solitary and in terminal racemes. Capsule 1.5–1.8 cm long, ovoid, densely hairy. Seeds reniform, densely silky-brown, hairy.

So far found at Surat, Broach, Rajpipla, Panchmahals, Ahmedabad, Talod and Saurashtra, mostly as a weed in cultivated fields; rare.

FLS & FRS: Aug.–Dec.

Hibiscus punctatus Dalz. in Dalz. & Gibs. Bombay Fl. 20. 1861; FBI 1:340; C 1:116; S & J 11.

Suffruticose herbs, 30–80 cm tall, scarcely branched. Leaves 2.5–8 × 5–9 cm, pellucido-punctate, stellately hairy, petiolate, unequally lobed, lobes sinuate-dentate. Flowers yellow, solitary or clustered at ends of branches. Capsule 1.2–1.5 cm long, ovoid, pubescent. Seeds large, black, dotted with minute stellate scales.

Saurashtra, Rajpipla (Ghantoli), Broach, Surat; rare.

FLS & FRS : Nov.–Dec.

Hibiscus radiatus Cav. Diss. 3:150. t. 54. f. 2. 1787; FBI 1: 335; C 1:112; WI 5.98; Ch & O in Ind. For. 92:533–535. 1967; S & J 11.

1.5–1.8 m tall, prickly undershrubs. Leaves 8–10 × 4–5 cm, entire or 3–5-lobed, ovate, lobes narrowly or broadly lanceolate. Flowers yellow with a chocolate or purple base within, axillary, solitary. Capsule ovoid, apiculate, densely hairy. Seeds brown, slightly reniform or subglobose, smooth.

Listed by Santapau (1962) on the authority of Thaker J. I. who also reported it from Kutch (1926). Saxton and Sedgwick (1918) have collected it from Dangs forest. (DUNO)

FLS & FRS : Sep.–Oct.

Hibiscus rosa-sinensis L. Sp. Pl. 694. 1753; FBI 1:344; C 1:120; Bailey 665; WI 5:91. Pl. 4 (col.); S & J. 11; S 18.

Shrubs, 3–5 m tall. Leaves 3–10.5 × 1.8–7.5 cm, ovate, glabrous or sparsely hairy beneath. Flowers 6–12 cm across, axillary, solitary.

Planted, seldom an escape. (JASUND, JASVANTI)

FLS : Throughout the year.

Hibiscus sabdariffa L. Sp. Pl. 695. 1753; FBI 1:340; C 1:117; Bailey 664; WI 5:92. f. 55; S & J 11.

1–3 m tall, deciduous, suffruticose herbs, with bright-to dark-red, glabrous stem and branches. Leaves entire or 3–5-lobed, dark-green or reddish—tinged, seldom completely red, midrib glandular at base beneath, lobes 2.5–9.5 × 0.6–2.5 cm, elliptic-lanceolate or elliptic-oblong, glabrous. Flowers solitary, axillary, 2–5 cm across, yellow with a deep purple base beneath. Capsule 1–2.5 cm broad, ovoid or subglobose, shortly apiculate, dark-red, silky-brown, hairy.

Cultivated, seldom an escape. (KHATI BHINDI, LAL -AMBADI)

FLS & FRS : Oct.–Jan.

Hibiscus schizopetalus Hk. f. in Bot. Mag. t. 6524. 1880; S & J 11; S 18.

Shrubs, 1.5–3 m tall. Leaves 3.3–10 × 1.2–7 cm, glabrous, ovate, obovate, or ovate-elliptic. Flowers axillary, solitary, drooping.

Planted.

FLS : All the year.

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Hibiscus surattensis L. Sp. Pl. 696. 1753; FBI 1:334; C 1:112.

Erect or trailing, prickly, hairy herbs, somewhat woody at base. Leaves 2–8×1–10 cm, entire or shallowly to deeply 3–lobed, petiolate, ovate–to almost orbicular, membranous, hairy, with leafy, auricled stipules. Flowers 3.5–4 cm across, axillary, solitary, yellow. Capsule 1.2–1.5×0.8–1 cm, ovoid, apiculate, densely hairy.

Dangs (*HS* 19604, 19717, 19959); locally abundant in dense hedges and forest undergrowth.

FLS & FRS : Oct.

Hibiscus trionum L. Sp. Pl. 697. 1753; FBI 1:334; C 1:111; S & J 11.

30–75 cm tall, stellately hairy herbs. Leaves 2.5–3.7 cm, deeply palmately 3–lobed, seldom entire and suborbicular, lobes toothed or secondarily lobed, obovate, hairy. Flowers 1.5–3.7 cm across, axillary, solitary, yellow with deep–purple base within. Capsule oblong, hairy. Seeds grey, minutely stellately hairy, dorsally rounded.

Kutch, Saurashtra and Bulsar. (MATHIO BHINDO, KOADIO BHINDO, KORADIO)

FLS & FRS July–Sep, seldom upto Jan.

Hibiscus vitifolius L. Sp. Pl. 696. 1753: FBI 1:338; C 1:115; WI 5:98; Ch & O 47; S & J 11.

0.5–1.5 m tall, erect undershrubs, with grey–tomentose ascending branches. Leaves 2-16×1–7 cm, entire or shallowly 3-5–lobed, ovate–triangular, hairy. Flowers 7–10 cm across, sulphur–yellow with deep chocolate or purple base within, axillary, solitary, pendulous. Capsule 1–1.7 cm across, 5–winged, obovate–orbicular, hairy. Seeds reddish–brown, reniform, minutely tuberculate.

Throughout in forest undergrowth; occasional. (VAN KAPAS, VANBHINDO)

FLS & FRS : Aug.–Feb.

KYDIA L.

Kydia calycina Roxb. Hort. Beng. 51. 1814 (nomen) & Pl. Cor. 3:12. t. 215. 1819; FBI 1:348; C 1:100; S & J 11; S 16.

13–20 m tall, deciduous trees with grey, rough, fibrous bark exfoliating into irregular flakes or vertical scales. Leaves 6–15× 7–17 cm, broadly ovoid to nearly orbicular, 3–5–angular or lobed, stellate–hairy above, grey–tomentose beneath. Flowers 2–2.8 cm across, in terminal panicles. Capsule 0.3–0.5 cm across. globose, grey–tomentose, enclosed in persistent calyx. Seeds reniform, brown, minutely hairy, concentrically ribbed. (WARANG, WARING, MOTI HIRVANI, NIHOTI HIRVANI).

FLS : Oct.–Nov. *FRS* : Nov.–Jan.

MALACHRA L.

Malachra capitata L. Syst. (ed. 12) 2:458. 1767; FBI 1:329; C 1:105; WI 6:228. f. 82; S & J 11.

30–150 cm tall, simple or sparingly branched, stellately scabrid herbs or undershrubs. Leaves 4.5–14.5×5–16.5 cm, coriaceous, orbicular, suborbicular or slightly ovate, entire or very slightly lobed, obtuse at apex, tapering at base. Flowers yellow, 4–8, in terminal, capitate head. Capsule 0.5–0.6 cm broad; ripe carpels whitish, prominently reticulate, cuneate. Seeds brown, smooth, glabrous.

Along sea coast, scattered or gregarious. (PARDESHI BHINDO)

FLS & FRS : Sep.–Jan.

MALVA L.

Malva parviflora L. Demonstr. Pl. 18. 1753; FBI 1:321; C 1:96; WI 6:249. f. 87; S & J 11.

15–45 cm tall, diffuse, hairy herbs. Leaves 2.5–5 cm across, shallowly 5–7–lobed, hairy. Flowers axillary, solitary or few

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fascicled. Fruit 0.5–0.6 cm across; ripe carpels 10–12, glabrous, one–seeded, dorsally, prominently keeled and winged. Seeds black, smooth glabrous.

Kutch (Blatter, 1908) and Saurashtra (Santapau, 1962); rare. (PRANIRAK, SUPRA)

FLS & FRS : Oct.

MALVASTRUM A. Gray *nom. cons.*

Malvastrum coromandelianum (L.) Garcke in Bonplandia 5:297. 1857; WI 6:251; Ch & O 41; S & J 11. *Malva coromandeliana* L. Sp. Pl. 687. 1753. *Malvastrum tricuspidatum* A. Gray, Pl. Wright. 1:16. 1852; FBI 1:321.

35–75 cm, tall, erect, appressed–hairy herbs. Leaves 2–7.5 cm, glabrescent to hairy. Flowers axillary, solitary, sessile or subsessile. Fruits 0.5–0.6 cm across, globose, depressed at apex; ripe carpels reniform, hairy, bicuspidate with a persistent style. Seeds brown, reniform, glabrous, minutely pitted.

Baroda, Pavagadh and Saurashtra (Mangrol); native of America; not common.

FLS & FRS : Throughout the year.

PAVONIA Cav. *nom. cons.*

Key to species

1. Involucral bracts 5–6, foliaceous; flowers yellow or pale–orange .. .. *P. patens*
1. Involucral bracts 8–12, subulate or linear; flowers white or pale–to bright–rose–coloured (seldom if flowers yellow, involucral bracts absent) :
2. Ripe carpels with 3 horned appendages .... *P. ceratocarpa*
2. Ripe carpels without horned appendages :

3. Leaves entire; ripe carpels hairy, winged .. *P. arabica*
3. Leaves 3–5–lobed; ripe carpels glabrous, not winged or very narrowly winged :
4. Ripe carpels very narrowy winged ... ..*P. zeylanica*
4. Ripe carpels not winged .. .. ..*P. odorata*

Pavonia arabica Steud. Nom. (ed.2) 2:279. 1841; FBI 1:331; C 1:107.

Appressed–stellate–hairy undershrubs. Leaves 1–2.5×0.6–1 cm, ovate. Flowers rose–coloured. Ripe carpels 5, 0.4–0.5 cm long, obovate–cuneate dorsally rounded and villous, ventrally slightly winged and glabrescent. Seeds obovate–cuneate, minutely hairy, faintly horizontally ribbed.

So far found only in Kutch; not common.

FLS & FRS : Aug.

Pavonia ceratocarpa Masters in Hk. f. FBI 1:331. 1874; C 1:108; S & J 11.

60–120 cm tall, stellate–hairy undershrubs. Leaves 1.2–3×0.6–1 cm, elliptic–oblong, stellate–hairy. Flowers yellow, solitary, axillary, clustered at ends of branches. Ripe carpels 0.4–0.5 cm long, cuneate, dorsally 3–horned and with winged appendages near base, dark–brown.

Kutch and Saurashtra; common. (KARNDIA, KHATI CHHAS KHATUMBDO, VADIDHATUVALJO, KHATUMBDEJO)

FLS & FRS : Aug.–Oct.

Pavonia odorata Willd. Sp. Pl. 3:837. 1800; FBI 1:331; C 1:108; WI 7:283.

Viscidly pubescent herbs. Leaves 2.5–4 cm across, 3–5–lobed, rotund–ovate, cordate at base, petiolate, distantly toothed. Flowers pink. Ripe carpels glabrous.

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Listed by Thaker J. I. (1926) from Kutch on the authority of Palin. (KALAVALA, SUGANDH BALA)

FLS & FRS : Sep.–Oct.

Pavonia patens (Andr.) Chiov. in Ann. Bot. 13:409. 1915; S & J 11. *Sida patens* Andr. Bot. Rep. 9:571. 1809. *Pavonia glechomifolia* Garcke in Schweinf. Beitr. Fl. Aethop 1:54. 1867; FBI 1:330; C 1:107.

30–120 cm tall, erect or diffuse, minutely stellate-hairy herbs. Leaves 3—4.5×2.5—5.5 cm, ovate to suborbicular, stellate-hairy. Flowers 2.5—4 cm across, axillary, solitary. Fruit 0.5—0.6 cm across; ripe carpels cuneate or obovate-oblong, minutely cuspidate, dorsally rounded and reticulate. Seeds reniform, smooth, glabrous, dark-brown.

Reported from Kutch, Saurashtra and North Gujarat (Khedbrahma); rare. (ADAVIA, ADALIA, FULADAN)

FLS & FRS : Aug.–Oct.

Pavonia zeylanica Cav. Diss. 3:314. t. 48. f. 2. 1787; FBI 1:331; C 1:108; WI 7:283. f. 123; Ch & O 46; S & J 11.

30–60 cm tall, viscidly-hairy herbs. Leaves 0.5–4×0.4—3.7 cm, 3-lobed, broadly ovate or nearly orbicular. Flowers 0.8—1.5 cm across, pink or seldom white, axillary, solitary and in terminal racemes. Fruits 0.4—0.6 cm across; ripe carpels pale-brown, glabrous, minutely winged, cuneate and dorsally rounded. Seeds cuneate, brown, almost glabrous, distinctly ribbed on dorsal side.

Throughout common.

FLS & FRS : July–Mar.

SENRA Cav.

Senra incana Cav. Diss. 2:83. t. 35. f. 3. 1786; FBI 1:334; C 1:110; S & J 11.

45–75 cm tall, grey-tomentose. Leaves 7–13.5×3.5–7 cm, ovate, entire or shallowly 3-lobed. Flowers 4–6 cm across, orange or yellowish-orange, axillary, solitary or in fascicles of 2–3. Capsule 1–1.5 cm long, hairy. Seeds globose, brown, hairy.

Kutch, Saurashtra and North Gujarat (Pahada); rather rare.

FLS & FRS : Aug.–Nov.

SIDA L.

Key to species

1. Plants velvety-hairy; carpels 10; carpellary awns longer than calyx segments and retrorsely scabrid .. .. *S. cordifolia*
1. Plants not velvety-hairy; carpels 3–10; carpellary awns shorter than calyx segment, not retrosely scabrid :

2. Carpels 5; leaves ovate, cordate, rounded or turncate at base:

3. Leaves obtuse or subacute at apex; petiole with 1–3 recurved spines at base .. .. .. *S. alba*
3. Leaves acute or slightly acuminate at apex; petiole without spinous tubercles at base :

4. Prostrate or suberect plants; leaves and branches scabrid .. .. *S. cordata*
4. Plants erect, viscidly hairy .. .. *S. glutinosa*

2. Carpels 6–10; leaves ovate, ovate–oblong, ovate–lanceolate, rhomboidal or obovate, acute, cuneate or tapering at base :

5. Leaves ovate, ovate-oblong, appressed-hairy; carpellary awns minute or absent .. .. .. *S. ovata*
5. Leaves lanceolate, rhomboidal or obovate, glabrous, hairy or grey-tomentose beneath; carpellary awns distinct :

6. Leaves glabrous, lanceolate .. .. *S. acuta*
6. Leaves lanceolate, rhomboidal or obovate, hairy or grey-tomentose beneath :

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7. Basal leaves obovate, obovate-oblong, cuneate .. .. *S. retusa*

7. Basal leaves rhomboidal .. .. *S orientalis*

Sida acuta Burm. f. Fl. Ind. 147. 1768; C 1:98; Ch & O 44; S 15; S & J 11. *Sida carpinifolia* L. f. Suppl. 307. 1781; FBI 1:323.

20–50 cm tall undershrubs, stellately hairy in younger parts. Leaves 1.5–10×0.5–6 cm, sessile or nearly so. Flowers yellow or pale-orange, axillary, solitary or 2–3-fascicled. Fruit 0.4–0.5×0.2–0.3 cm, globose; carpels 6–8, cuneate, glabrous, reticulate, pale-brown. Seeds cuneate, dark-brown or blackish-brown, smooth, glabrous.

Throughout, common. (BALA)

FLS & FRS : Aug.–Feb.

Sida alba L. Sp. Pl. (ed.2) 960. 1762; S & J 11. *Sida spinosa* L. Sp. Pl. 683. 1753 *p. p.*; FBI 1:323; C 1:98; Ch & O 43; WI 9:325.

50–100 cm tall undershrubs, stellately hairy or grey-tomentose in younger parts. Leaves 1–5×0.5–2.5 cm, ovate, ovate-oblong or ovate-elliptic, glabrous or nearly so above, grey-tomentose beneath, petiolate. Flowers 0.5–0.8 cm across, yellow or seldom white, axillary, solitary and crowded at ends of branches. Fruits 0.4–0.5 cm across, globose or nearly so; ripe carpels 5, glabrous, dorsally rounded, ventrally reticulate.

Throughout, scattered; common. (KANTALOBALA)

FLS & FRS : Aug.–Dec.

Sida cordata (Burm. f.) Borss. in Blumea 14:182. 1966. *Melochia cordata* Burm. f. Fl. Ind. 143. 1768. *Sida veronicaefolia* Lam. Encycl. Meth. 1:5. 1783; C 1:97; Ch & O 42; S & J 12; WI 9:325. f. 105. *Sida humilis* Cav. Diss. 5:227. t. 134. f. 2. 1788; FBI 1:322.

Perennial, patently hairy herbs. Leaves 2.5–11×2–7.5 cm, membranous, ovate, appressed-hairy on both surfaces. Flowers yellow, axillary, solitary or geminate and clustered at ends of branches. Fruit 0.3–0.5 cm across, globose; ripe carpels 5, 0.2–0.3 cm long, finely hairy, cuneate. Seeds brown, glabrous, smooth.

Throughout, common. (BHOYABALA, NIDHIDHATUVAL)

FLS & FRS : Throughout the year.

Sida cordifolia L. Sp. Pl. 684. 1753; FBI 1:324; C 1:99; Ch & O 44; S & J 11; WI 9:323. f. 105.

45–100 cm tall, white or grey-tomentose undershrubs. Leaves 1.2–8×2.5–7.5 cm, ovate, tomentose. Flowers 0.8–1 cm broad, axillary, solitary and clustered at ends of branches. Fruits 0.4–0.6 cm across, subglobose, tomentose; ripe carpels 10, dorsally rounded, reticulate.

Throughout in plains; not frequent, at some places rare. (BALA, BALADANA, KHARENTI)

FLS & FLS : Aug.–Dec.

Sida glutinosa Cav. Diss. 1:16. t. 2. f. 8. 1785; C 1:97; Ch & O 42; S & J 12. *Sida mysorensis* W. & A. Prodr. 1:59. 1834; FBI 1:322.

An erect, rigid, glutinous-hairy herb, 40–90 cm tall. Leaves 2.8–10×1.5–9 cm, membranous, broadly ovate to ovate-lanceolate, appressed-hairy, petiolate. Flowers yellow, axillary, solitary or fasciculate culminating into apparent 15–20 cm long terminal racemes. Fruits 0.2–0.3 cm broad, obovate, thinly hairy, of 5 carpels. Seeds dark-brown, glabrous, smooth.

Throughout (except Kutch), frequent in forest undergrowth. (CHIKNIBALA)

FLS & FRS : Aug.–Dec.

Sida orientalis Cav. Diss. 1:21. t. 2. f. 1. 1785; Ch & O 44. *Sida rhombifolia* L. var. *rhomboidea* Masters in Oliver, Fl. Trop.

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Afr. 1:81. 1868; FBI 1:324. *Sida rhombifolia* L. Sp. Pl. 684. 1753; FBI 1:323; S & J 12

Similar to *S. retusa* L. but differs from it in leaf shape and short size of carpellary awns.

South Gujarat (Bulsar, Dangs, Vyara, Rajpipla), Central Gujarat (Pavagadh, Chhotaudepur), North Gujarat (Khedbrahma) and Saurashtra; not frequent.

FLS & FRS : Sep.–Dec.

Sida ovata Forsk. Fl. Aegypt.–Arab. CXW et 124. 1775; S & J 12. *Sida grewioides* Guill. et Perr. ex Guill., Perr. et A. Rich. Fl. Senegamb. Tent. 1:71. 1830; FBI 1:323; C 1:98; Ch & O 43.

50–100 cm tall, erect, stellately hairy undershrubs. Leaves 1.5–4 × 1.3–2.7 cm, ovate–oblong, stellately grey–tomentose beneath. Flowers pale–yellow or white, axillary, solitary, clustered at ends of branches. Fruit 0.5–0.6 cm across, subglobose; ripe carpels 6–8, minutely mucronate or without mucro, brown, prominently veined, stellate–hairy. Seeds reniform, dark–brown, smooth or very minutely pitted.

Throughout; common in Kutch, Saurashtra and North Gujarat.

FLS & FRS : Aug.–Feb.

Sida retusa L. Sp. Pl. (ed. 2) 961. 1762; S & J 12. *Sida rhombifolia* L. var. *retusa* Masters in Hk. f. FBI 1:324. 1874; C 1:99; Ch & O 43.

Slender, stellately hairy undershrubs, 45–100 cm tall. Leaves 3–7.5 × 0.8–5.5 cm, broadly elliptic–lanceolate or lanceolate in upper parts, glabrescent above, stellately white–or grey–tomentose beneath. Flowers reddish–yellow, axillary, solitary and clustered at ends of branches. Fruit 0.3–0.5 cm across, nearly globose; carples 5, each two awned, hairy. Seeds dark–brown, smooth, glabrous.

Throughout except Kutch; common.

FLS & FRS : Sep.–Dec.

THESPESIA Soland. ex Corr. *nom. cons.*

Thespesia populnea (L.) Soland. ex Corr. in Ann. Mus. Paris 9:290. 1807; FBI 1:345; C 1:122; S & J 12. *Hibiscus populneus* L. Sp Pl.694. 1753.

Evergreen trees, 8–15 m tall, with grey. smooth bark. Leaves 5–20 × 4.2–16.5 cm, entire, stellate–tomentose beneath. Flowers pendulous, axillary, solitary. Capsule 2–3.5 cm across, globose, depressed on top, minutely stellate–scaly. Seeds ovoid or cuneate–oblong, black, hairy.

Planted in gardens and on road sides. (PARAS PIPLO, PARDESHI BHINDI).

FLS & FRS : Thoughout the year.

URENA L.

Urena lobata L. Sp. Pl. 692. 1753; FBI 1:329; C 1:106; Ch & O 46; S & J 12; S 17.

30–90 cm tall, stellately hairy, suffrutescent herbs or undershrubs. Leaves 1.5–10.5 cm broad, seldom entire, broadly ovate or nearly orbicular, stellate–grey–tomentose beneath. Flowers 1.6–2.4 cm across, rose–coloured, axillary, solitary. Fruits 0.8–1.2 cm acrosss, globose; ripe carpels 0.4–0.6 cm long, dorsally rounded, hairy and minutely reticulate. Seeds reniform, grey, glabrescent, faintly reticulate.

Throughout; not common. (VAGADAU BHINDO)

FLS & FRS : Aug.–Dec.

BOMBACACEAE

Key to genera

1. Trunk much enlarged towards base, gradually becoming thinner and branched above the middle, unarmed; flowers solitary, pendulous; involucral bracts 2; fruit woody, indehiscent baccate; seeds reniform, embedded in fleshy pulp .. *Adansonia*

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1. Trunk uniformly thick, armed; flowers bright-to deep-red, seldom white or yellow, crowded on leafless branches; involucral bracts absent or fugacious; capsule dehiscent: seeds not embedded in pulp .. .. *Bombax*

ADANSONIA L.

Adansonia digitata L. Sp. Pl. 1190. 1753; FBI 1:348; C 1:126; WI 1:30; S & J 12.

10–20 m tall, deciduous trees, with grey, smooth bark. Leaflets 3–7(-9), 2.5–12×1.2–5 cm, sessile or subsessile, obovate–oblong or elliptic–oblong, densely silky-brown-hairy, at length glabrous above. Flowers 10-12 cm across. Fruit 20–25 cm long, ellipsoidal, pale-brown, densely hairy.

Cultivated, seldom in waste places as self-sown. (SAMPUDIZO ZAD, RUKH, RUKHDO, GORAKH AMBLI, CHOR AMBLI).

FLS : Apr.–May. *FRS* : June–Dec.

BOMBAX L.

Bombax ceiba L. Sp Pl. 511. 1753 *p. p.*: Robyns in Taxon 10:68 & 160. 1961; Ch & O 48: S & J 12: S 20. *Bombax malabaricum* DC. Prodr. 1:479. 1824; FBI 1:349; C 1:127. *Salmalia malabarica* (DC.) Schott & Endl. Melet. 35. 1832; Chatterjee in Ind. For. 76: 184. 1950

10–30 m tall, deciduous trees, with grey, glabrous bark; prickles conical, black. Leaves crowded at ends of branches, petiolate, digitately 5–7-foliolate; leaflets 5–23×1.5–9 cm, ovate–lanceolate or elliptic–lanceolate, glabrous. Flowers 6–8 cm or more across, sessile, crowded, at ends of leafless branches. Capsule 9–13×3.5–6 cm, 5-valved; valves ovate–lanceolate, woody, rough, glabrous, dark-reddish-brown, minutely apiculate.

Throughout in deciduous and scrub forests. (SAVAR, SHIMLO).

FLS : Feb.–Apr. *FRS* : Mar.–June.

STERCULIACEAE

Key to genera

1. Flowers unisexual or polygamous; petals absent:
   2. Flowers bright-orange; follicle membranous, dehiscing before ripening .. .. *Firmiana*
   2. Flowers pale-yellow or olive-green without; follicle coriaceous or woody, dehiscing when ripe .. .. *Sterculia*

1. Flowers bisexual; petals present:
   3. Ovary raised on a gynophore; follicles spirally twisted .. .. *Helicteres*
   3. Ovary not raised on a gynophore; follicles not spirally twisted:
      4. Stamens more than 10:
         5. Petals deciduous; staminal column antheriferous throughout; staminodes absent; seeds winged .. .. *Eriolaena*
         5. Petals deciduous or persistent; stamens 15–20, fertile ones 15, 3 in each fascicle; sterile 5 petaloid; seeds not winged:
            6. Flowers deep-red; petals sessile; leaves equilateral at base; capsule subglobose, not tuberculate .. .. *Pentapetes*
            6. Flowers yellow; petals clawed; leaves inequilateral at base; capsule minutely tuberculate .. *Guazuma*
      4. Stamens not more than 10:
         7. Fertile stamens 5, sterile ones 5; capsule 5-valved, each valve one-seeded:
            8. Petals deciduous .. .. .. *Byttneria*
            8. Petals persistent .. .. .. *Melhania*

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7. Fertile stamens 5; staminodes absent :

9. Flowers rose-coloured : capsule 5-valved, loculicicidal dehiscent; valve 2-seeded .. .. *Melochia*

9. Flowers yellow; capsule 2-valved, valve one-seeded .. .. *Waltheria*

BYTTNERIA Loefl. *nom. cons.*

Byttneria herbacea Roxb. Pl. Cor. 1:t. 29. 1795; FBI 1:376; Thaker J. I. Fl. Saurashtra 96. 1910 & Fl. Kutch 43. 1926; S & J 12 (*Omne sphalum Buttneria*).

This species is listed from Kutch and Saurashtra by Thaker J. I. and on his authority, it is also listed by Santapau (1962). (ADBAUBAL, VAGDAUBAL, HANJ, HANJU, BUVARO).

ERIOLAENA DC.

Key to species

1. Flowers 1–3 in a cyme; capsule 5–7 cm long, conical, not tuberculate .. .. *E. stocksii*

1. Flowers several, in a cyme; capsule upto 5 cm long, ovoid, tuberculate or not :

2. Sepals lanceolate; style densely hairy; capsule tuberculate .. .. *E. hookeriana*

2. Sepals linear-oblong; style glabrous; capsule not tuberculate .. .. *E. candollei*

Eriolaena candollei Wall. Pl. As. Rar. 1:51. 1830; FBI 1:370; C 1:140; WI 3:189; Patel R. I. For. Fl. Gujarat 85. 1971.

Trees, with grey bark. Leaves 12–20 × 7.5–12.5 cm, broadly-ovate, glabrous or sparsely stellate hairy above, grey-tomentose beneath, petiolate. Flowers 3–4.5 cm across in corymbose cymes. Capsule woody, ovoid, acute, beaked, 10-valved.

The only authority for the inclusion of this species is that of Patel R. I. who lists it from Dangs. (BOTHI)

FLS : Mar.-May.

Eriolaena hookeriana W. & A. Prodr. 1:70. 1834; FBI 1:370; C 1:139; WI 3:189.

4-6 m tall, deciduous trees. Leaves 4–15 × 4–5 cm, broadly ovate, minutely stellate-hairy. Flowers yellow. Capsule 2.5–4 cm long, ovoid, subacute at apex, 10-valved; valves woody, thinly to densely stellate-hairy, Seed wings papery, brown.

Chhotaudepur and Pavagadh forests; rare.

FLS & FRS : Aug.-Sep ; fruits upto November.

Eriolaena stocksii Hk. f. & Th. in Hk. f. FBI 1:370. 1874; C 1:139; Shah & Suryanarayana in Ind. For. 94:894. 1968.

3–5 m tall trees, with rough bark. Leaves 7–15 × 4–12.5 cm, broadly ovate or nearly orbicular, stellate-hairy above, grey-tomentose beneath. Flowers 4–7 cm across; deep-yellow or reddish-yellow. Capsule 5–7 cm long, conical, 6–7-valved, stellately hairy. Seed wings papery, brown.

Dangs and Rajpipla forests; rare.

FLS : June-July. *FRS* : Aug.-Oct.

FIRMIANA Marsig.

Firmiana colorata (Roxb.) R. Br. in Benett & Brown, Pl. Java Rar. 235. 1844; Ch & O 51; S & J 12. *Sterculia colorata* Roxb. Pl. Cor. 1:26. t. 25. 1795; FBI 1:359; C 1:133. *Erythropsis colorata* Burkill in Gard. Bull. Straits Settl. 5:231. 1931; WI 3:199. f. 128.

16–18 m tall, deciduous trees, with straight trunk and grey bark. Leaves crowded at ends of branches, 15-20 cm long and almost as much broad, 3–5-lobed. Flowers 2–3 cm long, deep-orange. Follicles deep-orange, 2.5-3.5 cm long. Seeds ovoid, smooth, glabrous, pale-brown.

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So far reported from Pavagadh, Chhotaudepur and Saurashtra; rare. (KODARO, KEDARO, KHAVAS).

FLS : Feb.–May. *FRS* : Mar.–June.

GUAZUMA Plum.

Guazuma ulmifolia Lam. Encycl. 3:12. 1789; WI 4:268. t. 134. *Guazuma tomentosa* H. B. & K. Nov. Gen. & Sp. 5:32. 1821; FBI 1: 375; C 1:144.

5–8 m tall trees with rough, brownish bark. Leaves 10–20 x 4–7 cm. ovate–oblong, hairy. Flowers 0.5–0.7 cm across, in terminal and axillary cymes. Capsule 0.8–1.2 cm long, oblong, woody, tuberculate, black when ripe.

Cultivated in gardens and along roads, seldom an escape. (RUDRAKSHI)

FLS & FRS: Throughout the year.

HELICTERES L.

Helicteres isora L. Sp. Pl. 963. 1753; FBI 1:365; C 1:136; WI 5:27. f. 17; Ch & O 50; S & J 12.

1.5–3 m tall trees. with smooth. pale–to dark–brown bark. Leaves 3–15 × 2.3–11 cm, obovate or elliptic–oblong, seldom almost orbicular, coriaceous, scabridly hairy. Flowers 3–3.7 cm long, in axillary fascicles of 2–6, bright–red, fading grey or lead coloured. Follicles 3.5–5 cm long, woody, at length pale–brown and almost glabrous. Seeds reddish–brown, triangular, glabrous, minutely tuberculate.

Throughout. common. (MARADSING, ATI, AITI, ATAI)

FLS : July–Oct., rarely upto April : *FRS* : Aug.–Apr.

MELHANIA Forsk.

Key to species

1. Leaves ovate, ovate–lanceolate; involucral bracts ovate, acute or acuminate, subcordate at base; inflorescence terminal; capsule villous; seeds minutely tuberculate .. *M. futteyporensis*

1. Leaves elliptic; involucral bracts reniform; inflorescence axillary; capsule hairy; seeds smooth .. .. *M. denhamii*

Melhania denhamii R. Br. in Denh. & Clapp. Trav. App. 232. 1826; FBI 1:373; C 1:142; S & J 12.

Trees or shrubs, white– tomentose in younger parts. Leaves stellately hairy above, white–tomentose beneath, petiolate. Flowers yellow. Capsule globose.

Listed by Santapau (1962) on the authority of a collection by Shri Murthy from Palitana and Bhavnagar.

FLS & FRS : Oct.–Dec.

Melhania futteyporensis Munro ex Masters in HK. f. FBI 1:373. 1874; Parker. For. Fl. 47. 1918: Blatter in Journ. Bombay nat. Hist. Soc. 34:883. 1931: S & J 12. *Melhania tomentosa* Stocks ex Masters in HK. f. FBI 1:373. 1874: C 1:142.

60–100 cm tall, stellately hairy undershrubs. Leaves 4.5–6.5 × 3–3.5 cm, white or grey–tomentose beneath. Flowers yellow or orange–coloured. Capsule subglobose.

So far found in Kutch, Saurashtra and Khedbrahma in North Gujarat. (ADABAU KHAPAT, VAGDAU KHAPAT)

FLS & FRS : Aug.–Oct.

MELOCHIA L.

Melochia corchorifolia L. Sp. Pl. 675. 1753; FBI 1:374; C 1:142; WI 6:334. f. 117; Ch & O 50; S & J 12.

45–120 cm tall, woody herbs or undershrubs, stellately hairy. Leaves 2.5 – 9 × 1.2 – 5.5 cm, ovate to ovate–lanceolate, glabrous or minutely hairy. Flowers pale–to deep–pink, 0.4–0.5 cm across, clustred, axillary or at ends of branches. Capsule 0.3–0.5 cm broad, globose, hairy. Seeds angular, mottled, stellate–hairy.

Scanned by CamScanner

Throughout, common in moist ground. (CHUNCHA KHAPAT)

FLS & FRS : July–Dec., sometimes upto April.

PENTAPETES L.

Pentapetes phoenicea L. Sp. Pl. 698. 1753; FBI 1:371; C 1:144; WI 7:308.

1-2 m tall, glabrous or sparsely stellate–hairy herbs. Leaves 3.3–11×0.6–3.3 cm, ovate–lanceolate, glabrous or sparsely stellate–hairy. Flowers 2.5–3 cm across. Capsule 1–1.2 cm broad, beaked, hairy. Seeds angular, rough.

Ornamental; also found as an escape in waste places. (DUPARI)

FLS & FRS : Aug.–Dec.

STERCULA L.

Key to Species

1. Panicles erect; sepals olive–green, hairy, hairs somewhat irritant; follicles bright–purple, densely hairy, hairs irritant .. .. *S. urens*

1. Panicles drooping; sepals pale–yellow and hairy outside, deep–red or purple within, glabrous; follicles bright–reddish–purple, hairy, hairs not irritant .. .. *S. villosa*

Sterculia urens Roxb. Pl. Cor. 1:25. t. 24. 1795; FBI 1:355; C 1:131; Ch & O 51; S & J 12.

8–18 m tall, deciduous trees, with bark smooth, greyish–white or pink, peeling off in papery scales. Leaves 20–36×20–48 cm, 5–7–lobed, velvety–hairy, lobes deltoid–ovate. Panicles 10–15 cm long, viscidly hairy. Follicles 4–6, 3–6×2–3 cm, ovoid–oblong. Seeds black, oblong, minutely wrinkled.

Throughout in deciduous and scrub forests; not common. (KADAI, KADIO, KADAYO, KAGDOLI, KANDOL, KATAI-JO-JAD)

FLS : Nov.–Apr. *FRS* : Dec.–May.

Sterculia villosa Roxb. ex DC. Prodr. 1:483. 1824; FBI 1:355; C 1:132; S & J 12.

Very similar to *S. urens* Roxb. in general appearance but can be distinguished by certain characters (see key). So far reported from Dangs, Modasa in North Gujarat and Saurashtra; rare. (SARDOL, UDAL)

FLS : Dec.–Mar. *FRS* : Feb.–June.

WALTHERIA L.

Waltheria indica L. Sp. Pl. 673. 1753; FBI 1:374; C 1:144; Ch & O 49: S & J 12.

Erect, simple or branched, slender, hairy undershrubs. Leaves 1.7–6.5×0.7–3 cm, broadly ovate, elliptic–oblong or ovate–elliptic, seldom obovate, rugose and hairy above, grey–tomentose beneath. Flowers 0.2–0.3 cm across, clustered in axillary, subpedunculate heads. Capsule villous, globose. Seeds brown, oblong or nearly so, minutely stellate–hairy.

Throughout (except Dangs); not common.

FLS & FRS : Aug.–Dec.

TILIACEAE

Key to genera

1. Petals glandular or foveolate at base (seldom eglandular); fruit globose, oblong or ellipsoidal, indehiscent :
   2. Fruit spiny, dry; spines hooked; herbs or undershrubs .. .. *Triumfetta*
   2. Fruit unarmed, drupe; shrubs or trees :
      3. Flowers in terminal, axillary, extra–axillary or leaf –opposed cymes; drupe 2–4–lobed .. .. *Grewia*
      3. Flowers in terminal racemes or panicles; drupe not lobed .. .. *Microcos*
1. Petals not glandular or foveolate at base; fruit dehiscent, long, if globose distinctly warty .. .. *Corchorus*

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CORCHORUS L.

Key to species

1. Capsule depressed globose, warty, without beak; valves woody .. .. *C. capsularis*
1. Capsule longer than broad, beaked; beak entire or 3-partite; valves thin :
   2. Capsule angular :
      3. Capsule winged; beak trifid .. .. *C. aestuans*
      3. Capsule not winged; beak entire :
         4. Capsule 4–7 cm long .. .. *C. trilocularis*
         4. Capsule upto 2.5 cm long .. .. *C. urticaefolia*
   2. Capsule cylindrical or linear-cylindrical :
      5. Beak entire :
         6. Capsule 4–7.5 cm long, 10-ribbed .. *C. olitorius*
         6. Capsule less than 4 cm long, not ribbed :
            7. Capsule glabrous .. .. .. *C. depressus*
            7. Capsule hairy .. .. .. *C. fascicularis*
      5. Beak divided .. .. *C. tridens*

Corchorus aestuans L. Syst. nat. (ed. 10) 107. 1759; WI 2:326; Ch & O 53; S & J 12; S 27. *Corchorus acutangulus* Lam. Encyc. Meth. 2:104. 1786; FBI 1:398; C 1:160.

Prostrate or diffuse, suffrutescent herbs, hairy in younger parts. Leaves 2.5–8 × 1.5–4.5 cm, petiolate, broadly ovate, ovate-oblong, or ovate-lanceolate, sparsely hairy or nearly glabrous. Flowers small, yellow, solitary or 2-3-fascicled, extra-axillary or leaf-opposed. Capsules 2.5–4 cm long, 3-winged; beak 3-fid each segment again 2-fid. Seeds brownish-black, angular, microscopically wrinkled.

Throughout, common. (CHUNCH, CHHADHARI CHUNCH)

FLS & FRS : Aug.–Dec.

Corchorus capsularis L. Sp. Pl. 529. 1753; FBI 1:397; C 1:157; WI 2:326; Ch & O 54; S & J 13; S 26.

40–200 cm tall, erect, glabrous herbs or undershrubs. Leaves 4.5–14 × 1.2–4 cm, ovate-lanceolate, glabrous. Flowers yellow, axillary or extra-axillary, solitary or 2–3-fascicled. Capsule 0.6–1.5 cm across, green, black on drying, warty. Seeds wedge-shaped, smooth, glabrous, deep-brown or blackish-brown.

Panchmahals, Chhotaudepur, Talod in north Gujarat, Saurashtra and Kutch; rare, subgregarious. (BOR CHHUNCHI)

FLS : Aug.–Oct. *FRS* : Sep.–Dec.

Corchorus depressus (L.) Stocks in Proc. Linn. Soc. 1:369. 1848; S & J 13. *Antichorus depressus* L. Mant. 64. 1767. *Corchorus antichorus* Raensch. Nom. Bot. (ed. 3) 158. 1797; FBI 1:398; C 1:159.

Much-branched, perennial herbs, with 15–35 cm long, glabrous branches. Leaves 0.5–2 × 0.4 0.6 cm, oblong, glabrous. Flowers yellow, numerous, in leaf-opposed fascicles. Capsules 1–1.5 cm long, often curved upwards, 4-valved. Seeds trigonous, black.

North Gujarat (Ahmedabad, Kadi). Saurashtra and Kutch; common. (BAHUPHALI)

FLS & FRS : Aug.–Jan.

Corchorus fascicularis Lam. Encycl. Meth. 2:104. 1786; FBI 1:398; C 1:159; S & J 13.

Diffuse herbs, woody at base, with 10–30 cm long, densely pubescent in younger parts. Leaves 1.5–5.5 × 0.5–1.5 cm, elliptic-oblong or obovate-oblong, nearly glabrous. Flowers yellow, in axillary, extra-axillary or leaf-opposed fascicles. Capsules 0.9–1.5 cm long, pubescent, shortly beaked, 3-valved, Seeds angular, cuneate, black, smooth.

Throughout, a weed in cultivated fields and in drying moist ground.

FLS & FRS : Aug.–Jan.

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Corchorus olitorius L. Sp. Pl. 529. 1753; FBI 1:397; C 1:158; WI 2:327. f. 132; Bailey 654; Ch & O 54; S & J 13.

Erect, 45–100 cm tall, glabrous undershrubs. Leaves 3.5–11 × 2.5–5.3 cm, ovate to ovate-lanceolate, glabrous. Flowers yellow, solitary or 2–3-fascicled, axillary or extra-axillary. Capsule cylindrical, glabrous, 4–5-valved. Seeds angular, dark-brown or blackish-brown, smooth, glabrous.

Throughout, common, scattered or subgregarious.

FLS & FRS : Aug.–Nov. Dried fruits upto February.

Corchorus tridens L. Mant. App. 566. 1771; FBI 1:398; C 1:159.

Erect or suberect, 30–100 cm tall, slender herbs. Leaves 5–10 × 1–2 cm, linear-oblong, ovate-oblong or lanceolate, glabrous. Flowers yellow, sessile or subsessile, leaf-opposed, solitary or 2–4-fascicled. Capsule 2.5–6 cm long, glabrous, slender, linear-cylindric, 3-valved; beak 3-fid. Seeds brownish-black, truncate.

South Gujarat (Broach), Central Gujarat (Pavagadh, Panchmahals), north Gujarat and Kutch; not frequent.

FLS & FRS: Aug.–Dec.

Corchorus trilocularis L. Mant. 77. 1767; FBI 1:397; C 1:158; S & J 13.

Annual or perennial, 20–50 cm tall, patently hairy herbs. Leaves 1.5–10.5 × 0.8–1.4 cm, ovate-oblong, elliptic-oblong or elliptic-lanceolate, glabrescent or nearly so. Flowers yellow, solitary or 2–3-fascicled, leaf-opposed, axillary or extra-axillary. Capsule straight or slightly curved, 3–4-gonous, glabrous. Seeds lead-black, smooth, trigonous. truncate.

Throughout, not common.

FLS & FRS: July–Mar.

Corchorus urticaefolius W. & A. Prodr. 1:73. 1834; FBI 1:397: Thaker J. I. Fl. Kutch 50. 1926.

This species is included on the authority of Thaker J. I. (1926); according to him, it is found in Kutch during monsoon in hills, cultivated fields and among grasses in waste lands. The capsules are similar to those of *C. trilocularis* but much shorter in length. (KHETRAU SURVAL, ADBAU CHHUNCHDI)

FLS & FRS: Often throughout the year.

GREWIA L.

Key to species and varieties

1. Leaves hoary-tomentose beneath, at least when young:
   2. Trees; leaves 5-6-nerved from base:
      3. Stipules foliaceous, auricled at base:
         4. Petals glandular at base .. .. *G. tiliaefolia* var. *tiliaefolia*
         4. Petals eglandular at base .. .. *G. tiliaefolia* var. *leptopetala*
      3. Stipules linear-lanceolate or subulate .. *G. subinequalis*
   2. Shrubs; leaves 3-nerved from base .. *G. damine*
1. Leaves not hoary-tomentose beneath:
   5. Flowers white:
      6. Flowers many, in terminal and axillary, sometimes extra-axillary, umbellate cymes .. .. *G. columnaris*
      6. Flowers 1-2 at ends of leaf-opposed peduncle .. .. *G tenax*
   5. Flowers yellow:
      7. Small trees; leaves glabrous, mostly glandular near base .. .. *G disperma*
      7. Shrubs or undershrubs, at times straggling; leaves eglandular, not glabrous:
         8. Leaves orbicular or slightly obovate, rugoso reticulate with numerous transverse veins above .. .. *G. villosa*

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8. Leaves not rugoso-reticulate above :

9. Leaves irregularly toothed or lobed at apex; shrubs straggling. .. .. *G. abutilifolia*

9. Leaves not as above; shrubs not straggling :

10. Leaves elliptic-lanceolate; flower buds oblong or ellpsoidal, not ribbed .. .. *G. flavescens*

10. Leaves linear-oblong, linear-lanceolate or ovate-lanceolate; flower buds ovoid and ribbed.. . .. .. *G. hirsuta*

Grewia abutilifolia Vent. ex Juss. in Ann. Mus. Paris 4:92. 1804; FBI 1:390; C 1:152. *Grewia aspera* Roxb. Hort. Beng. 42. 1814 (nomen) & Fl. Ind. 2:591. 1832.

1.5–4 m tall, stellately hairy shrubs. Leaves 2.5–16×1.3–13.5 cm, entire or shallowly lobed, broadly ovate, ovate-elliptic, elliptic-oblong or nearly orbicular, scabrous and stellately hairy. Flowers 0.8–1 cm across, in axillary fascicles. Drupe 1–1.2 cm in diameter, fleshy, faintly 4–lobed, rugose, minutely stellate-hairy.

In deciduous forests of Sanjan, Bulsar, Rajpipla. Chhotaudepur and Saurashtra; rare.

FLS & FRS : July–Oct.

Grewia columnaris Sm. in Rees, Cyclop. 17. no. 5. 1811; FBI 1:383; C 1:146.

Large shrubs or small trees, 3–4 m tall. Leaves 2.6–5×1.5–2.5 cm, elliptic-oblong, stellately hairy, 3–nerved. Flowers white. Drupe 0.8–1 cm across. subglobose, depressed above, slightly 4–lobed, hairy; hairs stiff from glandular bases.

Reported from Bulsar.

FLS & FRS : Oct.

Grewia damine Gaertn. Fruct. 2:113. 1791; WI 4:266. f. 131; S & J 13. *Grewia salvifolia* Heyne ex Roth, Nov. Pl. Sp. 239. 1821; FBI 1:386; C 1:149 (non L. f. 1781).

1–3 m tall shrubs, appressed-tomentose in younger parts. Leaves 4–7×1–2.5 cm, ovate-oblong or ovate-lanceolate, hoary-tomentose beneath. Flowers yellow, few, in axillary, umbellate cymes. Drupes 0.4–0.6 cm broad, 2–4–lobed, deep-reddish-yellow when ripe.

Central Gujarat (Chhotaudepur forest division., Kawant range), north Gujarat, Saurashtra and Kutch; not frequent. (SISOTI, SEN, SEN ZO ZAD)

FLS : Jan.–July. *FRS* : Jan.–Oct.

Grewia disperma Rottl. ex Spreng. Syst. 2:579. 1825; S 24. *Grewia laevigata* auct. non Vahl 1790; FBI 1:389; C 1:152.

Deciduous, 3–5 m tall trees, with glabrous branches. Leaves 6.5–16×1.3–5.5 cm, lanceolate. Flowers yellow, in axillary, umbellate cymes. Drupe glabrous, 1–4–lobed.

So far reported from Bulsar.

FLS & FRS : Oct.

Grewia flavescens Juss. in Ann. Mus. Paris 4:89. 1804; WI 4:266; S & J 13. *Grewia pilosa* auct. non Lam.; FBI 1:388; C 1:151.

2–4 m tall shrubs, with sarmentose, hairy branches; bark brown, smooth. Leaves 1.5–8 × 0.9–2.6 cm, thinly appressed-pubescent. Flowers yellow, in axillary or extra-axillary, pedunculate, umbellate cymes. Drupes 0.8–1 cm across, globose, smooth, glabrous, orange-coloured when ripe, 1–2–lobed.

Throughout (except Kutch) in hedges and as forest undergrowth.

FLS : Aug.–Oct. *FRS* : Sep.–Nov.

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Grewia hirsuta Vahl, Symb. Bot. 1:34. 1790; FBI 1:391; C 1:153; WI 4:266; S & J 13.

1-2.5 m tall, erect undershrubs, softly rufous-pubescent. Leaves 8–15 × 1–3.5 cm, glabrescent or stellate-hairy. Flowers pale-to bright-yellow, in axillary, or extra-axillary, umbellate cymes. Drupes 0.6 – 1 cm, rounded or slightly reniform, brown, sparsely hairy, 2–4–lobed.

Bulsar, Rajpipla, Chhotaudepur forest division, Panchmahals, north Gujarat and Saurashtra; not common. (KHADDHAMNI)

FLS & FRS : July–Nov.

Grewia subinequalis DC. Prodr. 1:511. 1824; WI 4:262. ff. 127-128; S & J 13. *Grewia asiatica auct.* non L. Mant. 1:122. 1767; FBI 1:386; C 1:150.

5–7 m tall trees, grey or white–stellate–tomentose in younger parts; bark ash–coloured, rough. Leaves 2.5–17 × 2–10 cm, ovate, stellately hairy above, white–tomentose beneath. Flowers yellow, in axillary or extra–axillary cymes. Drupes 0.4-0 6 cm across, globose, dark–purple to almost black when ripe, sparsely hairy.

Planted in garden; ripe fruits edible. (PHALSA)

FLS : Feb.–July. *FRS* : Apr.–July

Grewia tenax (Forsk.) Fiori. Bos. Piant. Legn. Eritr. 246. 1909; S & J 13. *Chadara tenax* Forsk. Fl. Aegypt.–Arab. 105 & 114. 1775. *Grewia populifolia* Vahl, Symb. Bot. 1:33. 1790; FBI 1:385; C 1:148; WI 4: 266.

Straggling shrubs, 1–2.5 m tall; bark smooth, light black. Leaves 2–4 × 1–2.5 cm, ovate, obovate or suborbicular, glabrous above, hairy beneath. Flowers 1–1.5 cm across. Drupe 1–1.5 cm in diameter, 2–4–lobed, orange–coloured, smooth, glabrous.

Throughout in scrub forests, in hedges (except South Gujarat). (NAGBALA, GANGETI)

FLS : July-Oct. *FRS* : Aug.–Jan.

Grewia tiliaefolia Vahl var. **leptopetala** Cooke, Fl. Pres. Bombay 1:142. 1901; Santapau, Fl. Saurashtra 1:69. 1962; S & J 13.

This variety is included by Santapau (1962) in Flora of Saurashtra on the authority of a specimen collected from Datar hills in Junagadh.

FLS : Oct.–Nov.

Grewia tiliaefolia Vahl var. **tiliaefolia.** *Microcos laterifolia* L. Sp. Pl. 514. 1753 (non G. laterifolia G. Don 1831).

Grewia tiliaefolia Vahl, Symb. Bot. 1:35. 1790; FBI 1:386; C 1: 150; WI 4:264. f. 129; Ch & O 54; S & J 13.

5–10 m tall trees; bark light–brown, rough, excorticating in irregular patches. Leaves 3.8–27.5 × 2.8–15 5 cm. broadly ovate –oblong, stellately pubescent above, hoary–tomentose beneath. Flowers 0.8–1·3 cm across. yellow, in axillary or extra–axillary cymes. Drupe 0.6–0.8 cm across, didymous, globose, entire or rarely 2–4–lobed, minutely hairy.

Throughout in deciduous forest, occasional, seldom in scrub forest. (DHAMAN)

FLS : Mar.–June. *FRS* : Apr.–July, sometimes upto Jan.

Grewia villosa Willd. in Ges. Naturf. Fl. Neue Schr. 4:205. 1803; FBI 1:388; C 1:151; WI 4:265; S & J 13.

0.6–2.5 m tall, stellately hairy shrubs. Leaves 8–17.5 × 5–13.5 cm, velvety villous beneath. Flowers in leaf–opposed or axillary fascicles. Drupes 0.8–1 cm across, globose, stellately hairy, orange coloured.

South Gujarat (Rajpipla), Central Gujarat (Chhotaudepur, Mahi ravines), north Gujarat, Saurashtra and Kutch; rather rare.

FLS & FRS : Aug.–Nov.

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MICROCOS L.

Microcos paniculata L. Sp. Pl. 514. 1753; S & J 13. *Grewia microcos* L. Syst. (ed. 12) 2:602. 1767; FBI 1:392; C 1:154.

Deciduous, 1–2.5 m tall shrubs. Leaves 5.5–21×2–10 cm, glabrous, lanceolate or elliptic–lanceolate. Flowers yellow, in 4.5–12.5 cm long panicles. Drupes 0.8–1.4 cm long, obcordate or obovate, glabrous, smooth, deep–purple when ripe.

So far found only in Saurashtra and Rajpipla; rare.

FLS : June–Sep. *FRS* : Sep.–Dec.

TRIUMFETTA L.

Key to species

1. Glabrous or sparsely hairy herbs; flowers in axillary fascicles; leaves entire, ovate to ovate–lanceolate; fruit and spines glabrous; spines 0.3–0.5 cm long .. .. *T. annua*
1. Stellately hairy to tomentose undershrubs; flowers in extra–axillary fascicles which in their turn are arranged in apparent terminal racemes; leaves entire and obovate or nearly orbicular or basal ones lobed gradually becoming entire and ovate or lanceolate; fruit hairy; spines on fruits glabrous or ciliate on one side, 0.1–0.2 cm long :
   2. Leaves obovate to nearly orbicular, white or grey–tomentose beneath; inflorescence terminal racemes; stamens 15–25; spines on fruits with swollen base, eciliate .. *T. rotundifolia*
   2. Leaves 3–lobed, broadly ovate, gradually becoming entire and ovate or lanceolate towards apex, not or seldom grey–tomentose beneath; inflorescence in axillary fascicles and in terminal, interrupted racemes; stamens less than 15; spines on fruits eciliate or ciliate on one side; spines not with swollen base :
      3. Fruit ovoid; spines eciliate .. .. *T. rhomboidea*
      3. Fruit oblong or ovate–oblong; spines ciliate on one side .. .. *T. pentandra*

Triumfetta annua L. Mant. 1:73 1767; FBI 1.396; Ch & O 52;S 26.

30–60 cm tall herbs. Leaves 3–9.2×1.9–5.5 cm. Flowers yellow, in axillary fascicles. Fruit 1–1.2 cm across, 4-celled, dark–brown, glabrous with hooked spines. Seeds brown, glabrous, rounded on dorsal side.

Dangs, Pavagadh and Chhotaudepur; rare.

FLS : Sep.–Oct. *FRS* : Sep.–Mar.

Triumfetta pentandra A. Rich. in Guill. & Perr. Fl. Sengal. t. 19. 1831; Shah & Suryanarayana in Bull. bot. Surv. India 11(3 & 4): 293. 1969. *Triumfetta neglecta* W. & A. Prodr. 1:75. 1834: FBI 1:396.

30–70 cm tall undershrubs. Leaves 1.2–8×0.7–7 cm, 3–lobed, stellately hairy. Flowers bright–yellow. Fruit 0.4–0.6 cm across, indehiscent, ovoid or ovoid–oblong, densely hairy. Seeds obconical, slightly reddish-brown, glabrous.

Throughout; common. (ZIPTI)

FLS : July–Oct. *FRS* : July–Feb.

Triumfetta rhomboidea Jacq. Enum. Pl. Carib. 22. 1760; FBI 1:395; C 1:156; Ch & O 52; S & J 13; S 26. *Bartramia indica*. L. Sp. Pl. 1753 (non *T. indica* Lam.). *Triumtetta bartramia* L. Syst Nat. (ed. 10) 1044. 1759 (nom. ambig.).

40–100 cm tall, undershrubs. Leaves 3–12×2–5 cm, stellate–hairy. Flowers 0.8–1 cm broad, bright–yellow. Fruit 0.4–0.7 cm broad, glabrous, or subglobose, densely hairy.

Throughout, common, scattered or subgregarious.

FLS : July–Oct. *FRS* : Aug.–Sep.

Triumfetta rotundifolia Lam. Encycl. Meth. 3:421. 1789; FBI 1:395; C 1:157; S & J 13.

Scanned by CamScanner

30-60 cm tall, erect, stellately hairy, suffruticose herbs. Leaves 1.5–6 cm long and almost as much broad. Flowers yellow, in 10–20 cm long, interrupted racemes. Fruit 0.4–0.5 cm broad, ovate or globose indehiscent, tomentose Seeds obconical or cuneate, reddish–brown, smooth, glabrous.

In scrub forest, common along roads and earth bunds, rarely in deciduous forest clearings. (ZIPTI, GOI. ZIPTI)

LINACEAE

LINUM L.

Key to species

1. Flowers blue or slightly purplish, 1–1.5 cm across; leaves 1–3.5 cm long .. .. *L. usitatissimum*
1. Flowers yellow, 0.5–0.6 cm across; leaves 0.6–1 cm long .. .. *L. mysurense*

Linum mysurense Heyne ex Benth. apud. Lindley in Bot. Reg. 16:sub t. 1326. 1830; W. & A. Prodr. 134. 1834; FBI 1:411; C 1:164; Ch & O 54; S 28.

15–20 cm tall, slender, pale–yellowish herbs. Leaves narrowly elliptic–oblong or obovate–oblong, glabrous. Capsule 0.2–0.4 cm broad, glabrous, globose. Seeds elliptic–oblong, compressed, brown, glabrous, shining.

Dangs, Rajpipla and Pavagadh; rare.

FLS & FRS: Sep.–Oct., rarely upto Dec.

Linum usitatissimum L. Sp. Pl. 277. 1753; FBI 1:410; C 1:164; Bailey 604; WI 6:119. ff. 46–47 & Pl. 4; S & J 13.

30-60 cm tall. slender, simple or sparingly branched, glabrous herbs. Leaves sessile, linear–lanceolate, glabrous. Flowers 2–2 5 cm across, axillary, solitary and in terminal, few–flowered, corymbose panicles. Capsule 0.8–1 cm across, ovoid or subglobose, glabrous. Seeds minute, compressed, dark–brown or nearly black.

Rare, as a weed in waste places in south Gujarat (Broach), central Gujrat (Tuwa), north Gujarat (Himmatnagar), Saurashtra and Kutch.

FLS & FRS: Sep.–Mar.

MALPHIGIACEAE

Key to genera

1. Flowers irregular, sepal with a large gland outside; style 1, seldom 2; wings elliptic, obovate or obovate–lanceolate, middle one largest .. .. *Hiptage*
1. Flowers regular; sepal eglandular; styles 3; wings orbicular or oblong.. .. .. *Aspidopteris*

ASPIDOPTERIS A. Juss.

Aspidopteris cordata A. Juss. in Ann. Sc. Nat. (Ser. II) 13:267. 1840; FBI 1:421; C 1:168: Santapau & Shah in Journ. Bombay nat. Hist. Soc. 62(2):202. 1965. *Hiraea cordata* Heyne in Wall. Cat. 1060. 1829 (nomen) ex W. & A. Prodr. 108. 1834.

An extensive climber, whitish–tomentose in younger parts. Leaves 7.5–18 × 5.5–15 cm, broadly ovate or suborbicular, appressedly hairy to nearly glabrous above, softly whitish–tomentose beneath. Flowers creamy–yellow, mildly fragrant, in axillary and terminal, tomentose panicles. Samara 1.5–2.2 cm across, orbicular, pale–brown, glabrous, finely reticulate.

Dangs, (Malegaon–Saputara, Pipaldahad, Shamgahan); common. (GHATI VEL)

FLS: Sep. *FRS*: Oct.–Jan.

HIPTAGE Gaertn.

Hiptage benghalensis (L.) Kurz in Journ. As. Soc. Bengal 14:36. 1879; S & J 13. *Banisteria benghalensis* L. Sp. Pl. 427. 1753. *Hiptage madablota* Gaertn. Fruct. 2:169. t. 116. 1791; FBI 1:418; C 1:167.

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An extensive, woody climber, hoary-tomentose in younger parts. Leaves 6-13 × 4-7 cm, elliptic-oblong or ovate-oblong, coriaceous, glabrous. Flowers showy, white. Fruit 3-winged, middle wing 2.5-3 × 0.8-1 cm, lateral ones 1.2-1.5 × 0.5-0.6 cm. Seed solitary, glabrous, globose.

Dangs (Malegaon-Saputara forests) and Saurashtra (Girnar). (MADHVI LATA, RAGATPIT, AUTALA)

FLS : Jan.-Mar. *FRS* : Feb.-May

ZYGOPHYLLACEAE

Key to genera

1. Petals absent .. .. *Seetzenia*
1. Petals present :
   2. Stamens 10 :
      3. Leaves pinnately compound; fruit spiny .. .. *Tribulus*
      3. Leaves simple or 1-3-foliolate; fruit not spiny :
         4. Leaves 1-3-foliolate .. .. *Fagonia*
         4. Leaves simple .. .. *Zygophyllum*
   2. Stamens 12-15.. .. .. *Peganum*

FAGONIA L.

Fagonia cretica L. Sp. Pl. 386. 1753; C 1:173; S & J 13. *Fagonia arabica* L. Sp. Pl. 386. 1753; FBI 1:425.

30-60 cm tall, spiny undershrubs. Leaflets 0.7-1.3 × 0.2-0.4 cm, narrowly linear, sessile or subsessile; stipular spines 0.6-1.2 cm long. Flowers bright-to deep-purple or rose-coloured, pedunculate, axillary, solitary. Fruit 5-lobed, cocci 0.3-0.4 cm broad, broadly ovoid, glandular-pubescent. Seeds flat, smooth, glabrous, pale-brown, oblong.

Kutch, Saurashtra and Kharaghoda in north Gujarat; common, scattered or subgregarious. (DHAMASA DHRAMAU)

FLS & FRS : Aug.-Dec.

PEGANUM L.

Peganum harmala L. Sp. Pl. 444. 1753; FBI 1:486; C 1:172; S & J 13.

An erect herb, 30-50 cm tall. Leaves 5-7.5 cm long, multifid; segments narow. Flowers white, solitary, sessile or stalked. Capsule globose, 0.4-0.6 cm across, deeply lobed, veined, glabrous.

Kutch and Saurashtra, on the sole authority of Thaker J. I. (1910, 1926).

FLS & FRS : Winter

SEETZENIA R. Br.

Seetzenia orientalis Decne. in Ann. Sc. Nat. (Ser. 2) 3:281. 1835; FBI 1:424; C 1:171.

Prostrate, glabrous herbs, somewhat woody at base. Leaves opposite, 3-foliolate, stipulate, fleshy, terminal leaflet largest. Flowers small, axillary, solitary. Stamens 5. Capsule ovate, 5-angled, separating into 5 cocci, each coccus one-seeded; seeds flat, ovoid.

This species is listed by Blatter (1908, p. 766) from Kutch.

FLS & FRS : Sep.-Oct.

TRIBULUS L.

Key to species

1. Cocci winged by confluent spines .. .. .. *T. alatus*
1. Cocci spines not confluent .. .. *T. terrestris*

Tribulus alatus Del. Fl. Aegypt.-Arab. Ill. 62.1812; FBI 1:423; C 1:171.

Procumbent or ascending, densely silky-villous herbs. Leaflets 3-6 pairs, 0.6-1.3 cm long, appressed-sericeo-villous, linear-oblong to elliptic-oblong. Flowers 1-1.2 cm across, yellow. Cocci 5, hirsute, each coccus 2-seeded.

Listed by Blatter (1908) from Kutch

FLS & FRS : Oct.-Dec.

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Tribulus terrestris L. Sp. Pl. 387. 1753; FBI 1:423; C 1:170; Ch & O 55; S & J 13.

Prostrate or procumbent, hairy herbs, somewhat woody at base. Leaves opposite, unequal or sometimes alternate; leaflets 5–7 pairs, 1–1.8 × 0.3–0.5 cm, sessile or subsessile, linear–oblong, appressed–hairy. Flowers yellow, solitary, axillary or leaf-opposite. Fruit 1–1.5 cm across, globose, spiny, of 5 cocci; each coccus hairy, minutely tuberculate, spiny. Seeds minute, oblong.

Throughout in plains. (BETHU GOKHRU, MITHU GOKHRU, AKANTI)

FLS & FRS : Throughout the year.

ZYGOPHYLLUM L.

Zygophyllum simplex L. Mant. 1:68. 1767; FBI 1:424; C 1:172.

Prostrate, much branched, glabrous herbs. Leaves 0.3–0.4 cm long, sessile, obovate-oblong. Flowers minute, solitary, deflexed. Fruit deflexed, ±0.2 cm long, oblong, of 5 cocci Seed spindle-shaped or ellipsoidal, smooth, glabrous.

So far found only in Kutch; rare. (PATLANI, ATHELI, ALETHI)

FLS & FRS : Aug.

GERANIACEAE

MONSONIA L.

Monsonia senegalensis Guill. & Perr. Fl. Senegal. Tent. 1:131. 1830; FBI 1:427; C 1:175; S & J 14.

Diffuse, 10–40 cm tall, hairy herbs. Leaves 1.5–3 × 1–1.5 cm, ovate, densely hairy beneath, ciliate on margins. Flowers violet–purple, prominently deflexed on long stalk. Fruit obconical, bristly, prolonged into 2.5–6 cm long, hairy beak.

Reported from Kutch, Saurashtra and Deesa in north Gujarat; not common. (RATI FULDI)

FLS & FRS : July–Aug.

AVERRHOACEAE

AVERRHOA L.

Averrhoa carambola L. Sp. Pl. 428. 1753; FBI 1:437; C 1:178; WI 1:139. Pl. 17 (4).

3–4 m tall trees. Leaves alternate, imparipinnate; leaflets 5–11, 2.3–6.5 × 1.6–4 cm. elliptic, glabrous above, pubescent beneath, terminal one largest. Flowers violet–purple, in 2.5–5 cm long, axillary panicle. Ripe berries 5–8 × 4–6 cm, greenish–yellow to orange–red, acidic, edible.

Planted; native of Trop. America. (KAMARAKH)

FLS : Apr.–Dec. *FRS* : June–Dec.

OXALIDACEAE

Key to genera

1. Prostrate herbs; leaflets 3; capsule linear–cylindric .. *Oxalis*
1. Erect herbs; leaves pinnately compound, of 6–12 pairs of leaflets; capsule ellipsoid–oblong or nearly globose .. *Biophytum*

BIOPHYTUM DC.

Biophytum sensitivum (L.) DC. Prodr. 1:690. 1824; FBI 1:436; C 1:177; WI 1:187; Ch & O 56; S & J 14. *Oxalis sensitiva* L. Sp. Pl. 434. 1753.

6–25 cm tall, glabrous annuals. Leaves 5–10 cm long; leaflets 0.4–1 × 0.2–0.5 cm, sessile, opposite, glabrous, oblong or obovate–oblong. Flowers yellow, often tinged red, shortly pedicellate, in terminal umbels. Capsule 0.2–0.5 cm long, glabrous, minutely apiculate. Seeds ovoid, light–brown, transversely ridged.

Throughout, in shaded spots and as a weed in cultivated fields. (RISAMNU, ZARERO)

FLS & FRS : Aug.–Dec.

Oxalis corniculata L. Sp. Pl. 435. 1753; FBI 1:436; C 1:177; Bailey 600; WI 7:198. f. 78; Ch & O 56; S & J 14.

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Annuals or perennials, with radially spreading branches. Leaves petiolate, glabrous or nearly so; leaflets 0.6–1.8×0.4–1.5 cm, obovate, sparsely appressed-hairy or nearly glabrous, sessile. Flowers yellow, subumbellate, on axillary peduncle. Capsule 1–1.5 ×0.2–0.4 cm, beaked, glabrescent. Seeds brown or reddish-brown, ovoid or ellipsoid, transversely ridged.

Throughout, in moist places and cultivated fields. (CHANGERI, NAVARI)

FLS & FRS : Throughout the year.

BALSAMINACEAE

IMPATIENS L.

Key to species and varieties

1. Leaves alternate :
   2. Spur 1.5–2.5 cm long .. . *I. balsamina* var. *coccinea*
   2. Spur 0.5–0.8 cm long .. .. .. *I. balsamina* var. *rosea*
1. Leaves opposite .. .. *I. kleinii*

Impatiens balsamina L. var. **coccinea** Hk. f. in Hk. f. FBI 1:454. 1874 & Rec. bot. Surv. India 4:7. 1904 & 4:32. 1905; C 1:185. *Impatiens balsamina* L. Sp. Pl. 938. 1753; WI 5:168; S & J 13.

30–60 cm tall, erect, nearly glabrous, simple or sparingly branched herbs. Leaves 2.5–16×1–3 cm, lanceolate or elliptic-lanceolate, glabrous. Flowers axillary, solitary or 2–6-fascicled, 2–2.5 cm across, light-to deep-purple or bright-reddish-purple. Capsule 0.5–1.2 cm long, ellipsoidal or ovoid, apiculate, tomentose.

Throughout; common. (TAKMARIA, GULMENDI, PANTAM BOL)

FLS & FRS: Aug.-Dec.

Impatiens balsamina L. var. **rosea** (Lindl.) Hk. f. in Hk. f. FBI 1:454. 1874; Ch & O 57; S 31. *Impatiens rosea* Lindl. in Bot. Reg. t. 27. 1841. *Impatiens balsamina* L. var. *brevicalcarata* Cooke, Fl. Pres. Bombay 1:174. 1901 & 1:185. 1958 (reprinted).

Similar to the previous variety except for the difference in the length of spur.

Saurashtra and Pavagadh; rare.

FLS & FRS: June-Nov.

Impatiens kleinii W. & A. Prodr. 140. 1834; FBI 1:445; C 1:181; S 31.

Erect or suberect, slender, glabrous herbs, 20–40 cm tall. Leaves 2.5–6.5×1–1.2 cm, sessile or petiolate, elliptic-oblong or lanceolate, memberanous, nearly glabrous. Flowers axillary, solitary or 2-3-fascicled, bright-purple, seldom white; spur as long as or shorter than flower length. Capsules 0.8–1.5 cm long, spindle-shaped, glabrous. Seeds shining, black, smooth, glabrous.

Dharampur, Dang, Vyara, and Rajpipla, in forest undergrowth; rare.

FLS & FRS: Aug.– Oct.

RUTACEAE

Key to genera

1. Unarmed .. .. *Murraya*
1. Armed :
   2. Leaves unifoliolate; stamens 20–60; fruit rind leathery.. .. .. *Citrus*
   2. Leaves multifoliolate; stamens definite or indefinite; fruit rind woody :
      3. Leaves 3-foliolate; rachis not winged; stamens 30–60; flowers bisexual .. .. *Aegle*
      3. Leaves imparipinnate; leaflets 5–7(–3); rachis winged; flowers polygamous; stamens 10–12 ... *Limonia*

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AEGLE Corr. nom. cons.

Aegle marmelos (L.) Corr. in Trans. Linn. Soc. 5:223. 1800; FBI 1:516; C 1:204; WI 1:33. Pl. 7 & ff. 4–5; Bor 245; Ch & O 57; S & J 14. *Crateva marmelos* L. Sp. Pl. 444. 1753.

A thorny, deciduous tree, 5–10 m tall; bark greyish–white or greyish–brown, smooth Leaflets 1.5–9.5×0.6–6 cm, ovate–elliptic or elliptic–lanceolate, glabrous. Flowers greenish–or creamy–white, in axillary panicles. Berries 6–10 cm across, globose or subglobose, with rough rind; rind greenish–white, on ripening yellow. Seeds obliquely lenticular or oblong, wrinkled, pale–brown, glabrous.

Throughout, in deciduous and scrub forests, common; also planted in gardens. (BILI)

FLS : Jan.–May *FRS* : Feb.–July

CITRUS

Citrus limon (L.) Burm. f. Fl. Ind. 173. 1768; Bailey 609; WI 2:190; S & J 14. *Citrus medica* L. var. *limon* L. Sp. Pl. 782. 1753. *Citrus limonum* Risso. in Ann. Mus. Paris 20:201. 1813 *Citrus medica* L. var *limonum* (Risso.) Hk. f. in Hk. f. FBI 1:515. 1875; C 1:201.

2–6 m tall, thorny, large shrubs or small trees, with pale–greenish–yellow, rough bark. Leaflets 2–10×1.5–4 cm, elliptic–oblong or elliptic–ovate, glabrous, gland–dotted. Flowers white, 0.8–1 cm across, fragrant, axillary, solitary or 2–3–clustered. Berries 2.5–4 cm in diameter, globose or ovoid, bright–yellow, mamillate. Seeds ellipsoid, white, glabrous.

Cultivated throughout. (LIMBU)

FLS & FRS : Throughout the year.

LIMONIA L.

Limonia acidissima L. Sp. Pl. (ed. 2) 554. 1762; Airy Shaw in Kew Bull. 1939:293; 1939; Bor 245; Ch & O 58. *Schinus limonia*

L. Sp. Pl. 389. 1753. *Feronia elephantum* Corr. in Trans. Linn. Soc. 5:225. 1800; FBI 1:510; C 1:203. *Feronia limonia* (L.) Swingle in Journ. Wash. Acad. Sci. 4:328. 1914; WI 4:18. Pl. 2. & f. 6; S & J 14.

Evergreen, 8–10 m tall trees, with greyish–brown, rough branches. Leaves alternate, 2.5–5.6 cm long; leaflets 0.5–2.7× 0.5–1.8 cm, opposite, obovate, glabrous. Flowers pale–greenish–yellow, at length brown, 0.9–1.3 cm across, in lateral and terminal, 4–7 cm long panicles. Berries 6–8 cm across, globose, many–seeded with greenish–white or pale–yellow rind.

Throughout, self sown, wild or planted. (KOTHI, KOTHA)

FLS : Mar.–July. *FRS* : Mar.–Dec.

MURRAYA J. G. Koenig ex L. nom. cons.

Key to species

1. Leaflets 11–25, not aromatic .. .. *M. koenigii*
1. Leaflets 3–9, aromatic .. .. .. *M. paniculata*

Murraya koenigii (L.) Spreng. Syst. 2:315. 1826; FBI 1:503; C 1:193; Bailey 608; WI 6:446. f. 174; S & J 14. *Bergera koenigii* L. Mant. 1:565. 1767.

3–5 m tall, large shrubs or small trees, deciduous, with dark–brown or nearly black bark. Leaves 8–20 cm long, alternate, imparipinnate; leaflets 11–25, ovate, ovate–lanceolate or somewhat ovate–rhomboid, gland–dotted. sessile or nearly so, glabrous. Flowers creamy–white or dirty–white, in 5–15 cm long, terminal, paniculate cymes.

Planted in gardens or near houses. (KADIPATTI, MITHO LIMDO)

FLS : Mar.–May

Murraya paniculata (L.) Jack in Malay. Misc. 1(5):31. 1820; Bailey 609; WI 6:447. f. 175; S & J 14; S 33. *Chalcas paniculata* L. Mant. 1:68. 1767. *Murraya exotica* L. Mant. 2:563. 1771 *(sphalm Murraea)*; FBI 1:502; C 1:193.

Scanned by CamScanner

Evergreen, shrubs or small trees, 3-5 m tall, with a pale-yellowish-brown, rough, corky bark. Leaves imparipinnate; leaflets 3-9, alternate, ovate, ovate-lanceolate or ovate-rhomboid, coriaceous, glabrous. Flowers white, in terminal and axillary, paniculate cymes.

Planted in gardens for fragrant flowers. (KAMINI, KUNTI, JASWANTI)

FLS : Throughout the year.

SIMAROUBACEAE

AILANTHUS Desf. nom. cons.

Ailanthus excelsa Roxb. Pl. Cor. 1:24. t. 23. 1795; FBI 1:518; C 1:205; WI 1:41; Ch & O 58; S & J 14.

10–20 m tall, deciduous trees, with greenish-white or grey, smooth bark. Leaves 60–100 cm long, crowded at ends of branches; leaflets 9–29, subopposite, 5–18×2.5–6.5 cm, ovate-lanceolate, coriaceous, densely pilose, at length glabrous. Flowers yellow, in 15–40 cm long, terminal and axillary, hairy panicles. Samara 2–6×0.5–1.5 cm, spindle-shaped, glabrous, one-seeded, reticulately veined. Seeds glabrous, oblong.

Throughout, frequent in scrub forests, rarely in cleared, dry deciduous forests. (RUKHDO, MOTO ARDUSO)

FLS : Dec.–Mar. *FRS* : Feb.–May

BALANITACEAE

BALANITES Del. nom. cons.

Balanites aegyptiaca (L.) Del. I 11. Fl. d' Eg. 263. t. 28. f. 1. 1813; WI 1:143. Pl. 22(4); Ch & O 55; S & J 14. *Ximenia aegyptiaca* L. Sp. Pl. 1194. 1753. *Balanites roxburghii* Planch. in Ann. Nat. Sci. (Ser. 4) 4(2):258. 1854; FBI 1:522; C 1:207.

Armed, deciduous, bushy shrubs or small trees, 2.5–4 m tall. Leaves 2-foliolate, petiolate; leaflets 1–3.5×0.4–1.7 cm,

elliptic-oblong or obovate-oblong, glaucous-green, pubescent. Flowers pale-greenish-yellow, in axillary, fascicled cymes. Drupes 4–4.5×2–3.5 cm, ovoid, yellowish-green when ripe.

Throughout, in scrub forests. (INGORIO, HINGORIYO, ANGARIO, REGOREA)

FLS : Dec.–Mar. *FRS* : Mar.–July

BURSERACEAE

Key to genera

1. Shrubs or small trees, often spinous; bark corky, dirty grey-white or ash-coloured, lenticellate; leaves 3-foliolate; Flowers brownish-red .. .. *Commiphora*
1. Medium-sized trees, unarmed; bark not as above; leaves pinnate; flowers creamy-white :
   2. Bark greyish-black or blackish-brown, rough, deeply-fissured; leaflets invariably with galls; panicles creamy-white or grey-tomentose; flowers polygamous; stamens of equal length; drupes indehiscent, globose; pyrenes not separating and not heart-shaped .. .. .. *Garuga*
   2. Bark pinkish to reddish, smooth, peeling off into papery scales; leaflets without insect galls; panicles pubescent; flowers bisexual; alternate stamens long; drupe trigonous, dehiscent; pyrenes heart-shaped, separating..... *Boswellia*

BOSWELLIA Roxb.

Boswellia serrata Roxb. ex Colebr. in As. Res. 9:379. t. 5. 1807; FBI 1:528; C 1:210; WI 1:208. Pl. 32(3) & 35(1); Bor 249; S & J 14.

10–15 m tall, deciduous trees. Leaves 15–25 cm long, alternate, at ends of branches; leaflets 13–31, 2–6.5×1–2.5 cm, sessile, ovate to ovate-lanceolate, hairy. Flowers white, in 8–20 cm long, axillary racemes at ends of branches. Drupes 1–1.4 cm long, glabrous; pyrenes 0.9×0.6 cm, reticulately veined, glabrous, retuse at one end.

Throughout in deciduous forests. (GUGAL, DHUPELIO)

FLS & FRS : Dec.–Apr.

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COMMIPHORA N. J. Jacq. nom. cons.

Commiphora wightii (Arn.) Bhandari in Bull. bot. Surv. Ind. 6:327. 1964. *Balsamodendron wightii* Arn. in Ann. Sc. Nat. 3:86. 1839. *Balsamodendron roxburghii* Stocks in Journ. As. Soc. Bombay 2:391. 1848. *Balsamodendron mukul* Hk. f. ex Stocks in Kew Journ. Bot. 1:259. t. 8. 1849; FBI 1:529. *Commiphora mukul* (Hk. f. ex Stocks) Engl. in DC. Mon. Phan. 4:12. 1883; C 1:212; WI 2:313. f. 119; Bor 250; S & J 14.

1–2.5 m tall, deciduous, bushy shrubs; bark peeling off in flakes. Leaflets 1.2–2.4×0.9–1.7 cm, obovate. Flowers red in fascicled cymes at ends of branches. Drupes 0.4–0.8 cm across, ovoid, shortly beaked, deep-red, 2–6-valved; pyrenes ovate, acute.

Central Gujarat (Mahi ravines near Vasad), north Gujarat (Idar, Pahada, Mahudi), Saurashtra and Kutch; common in the last two zones. (GUGAL)

FLS & FRS : Jan.–May

GARUGA Roxb.

Garuga pinnata Roxb. Hort. Beng. 33. 1814 (nomen) & Pl. Cor. 3:5. t. 208. 1819; FBI 1:528; C 1:211; Bor 250; WI 4:117. f. 55; Ch & O 59; S & J 14; S 35.

7–15 m tall, deciduous trees. Leaves 20–36 cm long, crowded at ends of branches; leaflets 11–21, 4–14×2.5–4.5 cm, subsessile, elliptic-oblong or ovate-lanceolate, pubescent beneath. Flowers creamy-white, tomentose outside, in 7–20 cm long panicles at ends of branches. Drupes 1.5–2 cm across, subpyriform, fleshy, smooth, glabrous; pyrenes 0.7–1 cm long, oblong, rugose.

Throughout, in deciduous forests. (KAKAD, KAKADIO, KADKADO)

FLS : Jan.–Mar. *FRS* : Feb–May

MELIACEAE

Key to genera

1. Leaflets entire; staminal column cuplike; capsule dehiscent; valves woody; seeds winged .. .. *Soymida*
1. Leaflets serrate or crenate; staminal column cylindric; fruit a drupe; seeds not winged :
   2. Flowers white; drupe one-loculate, one-seeded; disc absent .. .. *Azadirachta*
   2. Flowers lilac, seldom yellow or creamy-yellow; drupes 5-loculate, each locule 1-seeded or less seeded by reduction; disc present .. .. *Melia*

AZADIRACHTA A. Juss.

Azadirachta indica A. Juss. in Mem. Mus. Paris 19:221. t. 13. f. 5. 1830; C 1:220; WI 1:140. Pl. 22 (5); Bor 254; Ch & O 59; S & J 14. *Melia azadirachta* L. Sp. Pl. 385. 1753; FBI 1:544.

10–15 m tall, evergreen trees, with light-black, slightly longitudinally furrowed bark. Leaves 15–40 cm long, crowded near ends of branches; leaflets 7–17, 4–8×1.5–2 cm, falcate, ovate-lanceolate, glabrous. Flowers white, in 10–22 cm long panicles, axillary or on old wood. Drupes 0.5–1.5×0.4–0.8 cm, ovoid-oblong, smooth, yellow. Seed hard, ellipsoid, glabrous.

Throughout, planted along roads, self sown and/or wild in forests but rare. (LIMDO)

FLS : Dec.–Mar. *FRS* : Jan.–May

MELIA L.

Key to species

1. Flowers lilac; anthers purple, as long as teeth of staminal column; planted.. .. .. *M. azedarach*
1. Flowers creamy-yellow; anthers white, longer than teeth of staminal column; wild .. .. .. *M. composita*

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Melia azedarach L. Sp. Pl. 384. 1753; FBI 1:544; C 1:218; Bor 253; Bailey 612. f. 103 a–e; WI 6:323. ff. 110–111; S & J 15.

5–10 m tall, deciduous trees, with dark-brown, shallowly longitudinally furrowed bark. Leaves 1–3-pinnate, 20–50 cm long; leaflets 3–13, 1.5–6.5×1–2 cm, ovate-lanceolate or elliptic-lanceolate, glabrous, subsessile. Flowers in 7–25 cm long, axillary panicles. Drupes 0.7–1.3 cm across, ellipsoid-oblong, yellow, 4–5-seeded.

Throughout, planted, not common. (BAKANLIMDO, BAKAN NIMB)

FLS & FRS : Nearly all round the year.

Melia composita Willd. Sp. Pl. 2:559. 1799; C 1:218. *Melia dubia* Hiern in Hk. f. FBI 1:545. 1875 (non Cav. 1789).

15–20 m tall, deciduous trees, with rough, dark-brown bark. Leaves 30–90 cm long, 2–3 pinnate; leaflets 5–11, 5–12×1–5 cm, ovate to ovate-lanceolate or elliptic-lanceolate, nearly glabrous. Flowers 0.5–0.8 cm long, creamy-yellow, congested, in terminal panicles. Drupe 2.1–2.8×1.5–2 cm, ovoid, subglobose or ellipsoidal, smooth, yellow.

Bulsar, Dangs, Rajpipla and Chhotaudepur; not frequent; (LIMBARA, NIMBARA, KADUNIMBARA, AMBARA)

FLS & FRS : Jan.–Mar.

Soymida febrifuga (Roxb.) A. Juss. in Mem. Muss. Paris 19:251. t. 22. f. 26. 1830; FBI 1:567; C 1:228; Bor 256; S & J 15. *Swietenia febrifuga* Roxb. Pl. Cor. 1:18. t. 17. 1795.

5–15 m tall, deciduous trees, with dark-brown or almost black, rough bark, exfoliating into large stripes or scales. Leaves crowded at ends of branches, 20–50 cm long; leaflets 7–13, 3–16×1–12 cm, sessile or subsessile, elliptic or oblong, coriaceous, glabrous. Flowers 0.7–1 cm across, greenish-white, in 15–30 cm long, axillary and terminal panicles. Capsule 3.5–7×2.5–4 cm, ovoid, woody, reddish-purple, at length blackish-brown.

South Gujarat (Dangs, Vyara, Rajpipla), Central Gujarat (Chhotaudepur, Panchmahals) and Saurashtra; occasional. (RAGAT ROHIDO, ROHN, ROYAN, ROYANI)

FLS : Feb.–Apr. *FRS* : Mar.–June

OPILIACEAE

CANSJERA A. L. Juss. nom. cons.

Cansjera rheedii Gmel. Linn. Syst. Nat. (ed. 13) 2:280. 1791; FBI 1:582; C 1:237; Ch & O 60; S 39.

Twining shrubs. Leaves 2.5–11×1.7–4.7 cm, ovate to ovate-lanceolate, distichous, coriaceous, glabrous. Flowers green or yellowish-green, 0.2–0.3 cm long, urceolate, in 1.5–2 cm long, axillary spikes. Drupe 0.7–1.6 cm long, ellipsoidal or ovoid, reddish-orange when ripe.

South Gujarat (Sanjan, Bulsar) and Pavagadh; rare

FLS : Nov.–Mar. *FRS* : Dec.–Mar.

OLACACEAE

OLAX L.

Olax nana Wall. ex Benth. in Trans. Linn. Soc. 18:678. 1838–1841; FBI 1:576; C 1:235; WI 7:91; S & J 15.

A low undershrub, with a woody root-stock. Leaves 2.5–7×0.6–1.8 cm, oblong-lanceolate, glabrous. Flowers white, axillary, solitary. Drupes 0.5–0.7 cm across, globose, deep-yellow when ripe.

On the sole authority of Macnaghten, it is listed from Saurashtra-Rajkot by Cooke (1958) and Santapau (1962). (SUDIYO, HIMI, TADHOLI)

FLS/FRS : Not given by these authors.

CELASTRACEAE

Key to genera

1. Twiners; inflorescence a pendulous raceme; ovary free from disc .. .. *Celastrus*

Scanned by CamScanner

1. Trees or shrubs; inflorescence a cyme; ovary confluent with disc ..
2. Armed shrubs; leaves alternate; fruit a capsule; seeds arillate .. .. *Maytenus*

2. Unarmed trees; leaves opposite or subopposite; fruit a drupe; seeds exarillate.. .. ..*Cassine*

CASSINE L.

Cassine glauca (Rottb.) O. Ktze. Rev. Gen. Pl. 1:114. 1891; D. Hou in Fl. Males. 6(2):286. 1962. *Mangifera glauca* Rottb. Nye Samml. Vid. Selsk. Skrift. 2:534. t. 4. f 1. 1783. *Eleodendron glaucum* (Rottb.) Pers. Syn. 1:241. 1805; FBI 1:623; C 1:248; WI 3:141. f. 88; Bor 227. *Eleodendron roxburghii* W. & A. Prodr. 157. 1834.

5–10 m tall trees, with grey or blackish-brown, rough, longitudinally fissurred bark. Leaves 6–15×3.5–6.5 cm, membranous or subcoriaceous, ovate–oblong or elliptic–oblong, glabrous. Flowers 0.15–0.3 cm across, greenish–yellow, numerous, minute, in axillary or extra–axillary, paniculate cymes. Drupes 0.6–1 cm long, obovoid, apiculate, glabrous.

In deciduous forests of central and south Gujarat; occasional. (BHUT ZAD, BHUTALAN, ALAN, ZADBHUTAKA)

FLS & FRS : Sep.–Nov.

CELASTRUS L.

Celastrus paniculatus Willd. Sp. Pl. 1:1125. 1797; FBI 1:617; C 1:245; WI 2:112. f. 51; D. Hou in Fl. Males. 6(2): 235. 1962: Ch & O 60; S & J 15; S 41.

Extensive twiners with pale–brown, warty–lenticellate bark. Leaves 3.5–17×2–12 cm, broadly ovate, obovate, elliptic–oblong or nearly orbicular, glabrous. Flowers greenish–yellow, in 7–20 cm long, terminal and axillary racemes. Capsule 0.4–0.8 cm across, bright–yellow, deep–red or orange when ripe, subglobose or ovoid. Seeds 4–6, brown, ovoid, ribbed, enclosed in scarlet or deep–red aril.

Throughout, in hedges or dense forests. (MALKAGANI, MALKANKNI, KANGNI, JIVAL, MALKANKANANI VEL)

FLS : Apr.–June *FRS* : May–Nov.

MAYTENUS Molin. emend. Bosc.

Maytenus emarginata (Willd.) D. Hou in Fl. Males. 6(2):241. 1962; S & J 15. *Celastrus emarginatus* Willd. Sp. Pl. 1(2): 1128. 1798 ex descr. *Gymnosporia montana* Bth. Fl. Austr 1:400. 1863 (pro comb. pro specim. (?)); FBI 1:621; C 1:247; WI 4:278. f 140. *Gymnosporia emarginata* Thw. Enum. Pl. Zeyl. 409. 1864. *Gymnosporia spinosa* (Blanco) Merr. & Rolfe in Philip. Journ. Sci. Bot. 3:109. 1908; Thaker J. I. Fl. Barda Mountains 15.1910. *Maytenus senegalensis* auct. non *Celastrus senegalensis* Lam.; Ch & O 60.

Thorny, bushy shrubs, 2–5 m tall, with grey or greyish–brown, rough bark. Leaves 1.5–6.5×0.7–4.5 cm, elliptic–obovate, obovate–oblong or spathulate–oblong. Flowers 0.2–0.3 cm across, creamy–white in 2–3.5 cm long, much branched cymes. Capsule 0.3–0.5 cm across, globose, glabrous, reddish–purple Seeds glabrous, chestnut–brown, rugose, enclosed in brown aril.

Throughout in plains and low hills, in hedges or in forest undergrowths; common. (VICO, VICKLO, VICKRO, VIGO)

FLS : Nov.–Feb. *FRS* : Dec.–Feb.

RHAMNACEAE

Key to genera

1. Unarmed, lianas; flowers in terminal and axillary panicles; fruit a winged nut .. .. *Ventilago*

1. Armed, erect trees or shrubs, rarely scandent or climbing; flowers in axillary fascicles .. .. .. *Zizyphus*

VENTILAGO Gaertn.

Ventilago denticulata Willd. in Ges. Naturf Fr. Neue Schr. 3:417. 1801; Ch & O 63. *Ventilago maderaspatana* Roxb. Pl. Cor. 1:55. t. 76. 1795; S 47. (non Gaertn. 1788); *Ventilago calyculata* Tulas. in Ann. Sci. Nat. (Ser.4) 8:124. 1857; FBI 1:631; C 1:254.

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An extensive liana. Leaves 5–17.5×2.6–8.5 cm, ovate-elliptic or ovate-oblong, glabrous or minutely pubescent. Flowers 0.2–0.3 cm across, greenish-yellow, in 15–20 cm long panicles. Nut 0.3–0.7 cm across, globose or subglobose, pubescent, with 3–5.5 cm long, obovate-oblong, glabrous wing, minutely bifid at tip.

In deciduous forests of south and central Gujarat; not common. (ASI, ASVEL, ACHHVEL)

FLS : Oct.–Jan. *FRS* : Nov.–Feb.

ZIZYPHUS Juss.

Key to species

1. Petals absent .. .. *Z. rugosa*
1. Petals 5 :
   2. Scandent or climbing shrubs .. .. *Z. oenoplia*
   2. Plants not as above :
      3. Leaves whitish or buff-coloured tomentose beneath:
         4. Trees; leaves 2–8×1.3–4.2 cm; fruit 1.25 cm or more in diam. .. .. .. *Z. mauritiana*
         4. Bushy shrubs; leaves 0.8–2.5×0.6–1.5 cm; fruit not more than 1.2 cm in diam. .. *Z. nummularia*
      3. Leaves not whitish or buff-coloured-tomentose beneath :
         5. Bushy shrubs, 1–1.5 m tall. .. .. *Z. horrida*
         5. Trees or shrubs, 3–7 m tall :
            6. Drupes not more than 1.5 cm in diam.; styles united for about half their lengths; leaves glabrous .. .. .. *Z. glabrata*
            6. Drupes 1.3–2.1 cm in diam.; styles free; leaves glabrous or hairy beneath :
               7. Leaves hairy beneath .. .. *Z. xylopyra*
               7. Leaves glabrous beneath .. *Z. glaberrima*

Zizyphus glaberrima Santapau in Journ. Bombay nat. Hist. Society 51:803. 1953; S & J 15; S 43.

3–5 m tall, armed shrubs or small trees. Leaves 3–6×2–4.5 cm, ovate-elliptic or orbicular. Flowers greenish-yellow, in axillary fascicles. Drupes globose or slightly depressed, glabrous. Seeds 0.7–0.8 cm across, orbicular.

Saurashtra and Dangs; rare.

FLS & FRS : Apr.–June

Zizyphus glabrata Heyne ex Roth, Nov. Pl. Sp. 159. 1821; FBI 1:633; S & J 15. *Zizyphus trinervia* Roxb. Hort Beng. 17. 1814 (nomen) & Fl. Ind. 1:606. 1832; C 1:256 (non Poir. 1813).

3–5 m tall, small trees, armed or unarmed, with greyish-white or ash-coloured bark in younger parts, pale-brown and rough in older. Leaves 3–8×1.4–6 cm, elliptic-oblong or ovate-oblong, glabrous. Flowers greenish-yellow, in axillary, fascicled cymes. Drupes globose, somewhat rugose, deep-yellow to orange when ripe.

Throughout in waste places; not common.

FLS & FRS : Aug.–Apr.

Zizyphus horrida Roth, Nov. Sp. Pl. 159. 1821; FBI 1:636; C 1:258.

Bushy shrubs, with divaricate branches and light-black or blackish-brown, shallowly longitudinally fissured bark. Leaves 1.5–2.5×0.8–1.5 cm, ovate, glabrascent. Flowers greenish-yellow, in axillary fascicles. Drupes 1–1.4 cm across, globose, glabrous, red when ripe.

In all zones except Kutch; rare.

FLS & FRS : Aug.–Nov.

Zizyphus mauritiana Lam. Encycl. Meth. Bot. 3:319. 1789; Bailey 646; Ch & O 61; S & J 15; S 43. *Zizyphus jujuba* Lam. Encycl. Meth. Bot. 3:318. 1789; FBI 1:632; C 1:256; Bor 241 (non Mill. 1768).

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Trees 3–8 m tall, armed, seldom unarmed, with blackish-brown, or light-black, longitudinally fissurred bark. Leaves ovate, ovate-oblong or suborbicular. Flowers greenish-yellow or creamy-white, in axillary fascicles. Drupes 1.5–2 cm long, globose, ovoid or ellipsoid-oblong, glabrous, reddish-yellow.

Throughout some varieties are cultivated in some parts of Gujarat. (BOR, BOADI, BORDI, BARJO ZAD)

FLS : Sep.–Feb. at times upto May. *FRS* : Nov.–Feb.

Zizyphus nummularia (Burm. f.) W. & A. Prodr. 162. 1834; FBI 1:633; Ch & O 62; S & J 15. *Rhamnus nummularia* Burm. f. Fl. Ind. 61. 1768. *Zizyphus rotundifolia* Lam. Encycl. 3:319. 1789; C 1:257.

Thorny, divaricately branched shrubs, 90–120 cm tall, with grey or pale-brown, smooth bark. Leaves alternate, broadly ovate to orbicular. Flowers greenish-yellow or creamy-white, in axillary fascicles. Drupes 0.5–0.8 cm in diam., globose, smooth, deep-red when ripe.

Throughout, common in arid and semi-arid regions, scattered or subgregarious, rare in dry deciduous forests. (CHANI BOR, PALERA, PALI, PALIA. CHANIA BOR)

FLS & FRS : July–Jan. Ripe fruits sold in markets upto April.

Zizyphus oenoplia (L.) Mill. Gard. Dict. (ed. 8) no. 3. 1768; FBI 1:634; C 1:257; Ch & O 62; S & J 15. *Rhamnus oenoplia* L. Sp. Pl. 194. 1753.

Scandent or climbing, armed shrubs, rusty-tomentose in younger parts. Leaves 2–8×1.2–4.3 cm, alternate, ovate to ovate-lanceolate, rufous-silky-pubescent beneath. Flowers greenish-yellow, globose or obovoid, orange-coloured.

Throughout, on hedges and on trees in forests; common. (BOYDI NO VELO, ERAMDI)

FLS : July–Oct. *FRS :* Aug.–Dec.

Zizyphus rugosa Lam. Encycl. Bot. 3:319. 1789; FBI 1:636; C 1:258; Ch & O 61; S & J 15.

Armed, scandent shrubs. Leaves 7–16×3.3–10 cm. broadly elliptic or ovate-oblong, glabrous above, rufous-pubescent beneath, coriaceous. Panicles 20–45 cm long, terminal, woody. Flowers pale-yellow or greenish-yellow. Drupes 0.6–0.9 cm in diam., globose or pyriform, whitish when ripe.

Bulsar, Dangs, Vyara, Pavagadh and Saurashtra; occasional. (TORAN)

FLS : Dec.–Apr. *FRS :* Feb.–Apr.

Zizyphus xylopyra (Retz.) Willd. Sp. Pl. 1:1104. 1797; FBI 1:634; C 1:258; Ch & O 62; S & J 15. *Rhamnus xylopyrus* Retz. Obs. 2:11. 1783.

3–6 m tall, armed or unarmed, large shrubs or small trees; bark blackish-brown, rough. Leaves 4–8.5×2.2–6.5 cm, broadly elliptic-oblong, ovate or suborbicular, appressed-hairy beneath. Flowers creamy-white or greenish-yellow, in axillary fascicles. Drupes globose, grey-tomentose.

In all zones; occasional in deciduous forest, rare in scrub forests. (GHOT BOR, GHAT BOR, GHUNT BOR, BOR GHAT)

FLS : Apr.–July *FRS* : May–Oct.

VITACEAE

Key to genera

1. Leaves compound; inflorescence axillary, if leaf-opposed, not on tendril; berries 2–4-seeded; seeds deeply pitted.. ..*Cayratia*

1. Leaves simple, entire or variously lobed; inflorescence on leaf-opposed tendrils; berries 1–3-seeded; seeds facetted, pitted, furrowed or smooth :

   2. Flowers tetramerous, bisexual; berries usually 1-seeded; seeds ellipsoid or pyriform, smooth, facetted or pitted .. .. *Cissus*

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2. Flowers tetra-or penta-merous; polygamo-dioecious; berries 2-3-seeded; seeds oblong or obovoid, convex on back, 2-furrowed on face .. .. *Ampelocissus*

AMPELOCISSUS J. E. Planch. nom. cons.

Key to species

1. Leaves tomentose; seeds obcordate .. .. .. *A. tomentosa*

1. Leaves not tomentose; seeds plano-convex.. .. *A. latifolia*

Ampelocissus latifolia (Roxb.) Planch. in Journ. Vigne Amer. 374. 1884 & in DC. Mon. Phan. 5 (2):370. 1887; S & J 15; S 44. *Vitis latifolia* Roxb. Hort. Beng. 18. 1814 (nomen) & Fl. Ind. 1:661. 1832; FBI 1:652; C 1:259.

An extensive, woody climber, with deep-reddish-purple, hollow stem and branches. Leaves 7-18×9-21 cm, petiolate, broadly ovate, 3-7-angled or deeply-lobed. Flowers ± 0.1 cm across, deep-red, in pyramidal, panicled cymes. Berries 0.6-1 cm across, smooth, globose, pale-to deep-purple, glabrous.

Throughout on hedges and forest undergrowth; common. (JANGLI DRAKSH)

FLS : June-Sep. *FRS* : Aug.-Dec.

Ampelocissus tomentosa (Heyne ex Roth) Planch. in Journ. Vigne Amer. 375. 1884; Ch & O 64. *Vitis tomentosa* Heyne ex Roth, Nov. Pl. Sp. 157. 1821; FBI 1:650; C 1:268.

Extensive, tendril climbers, tomentose. Leaves 10-20 cm long and as much broad, palmately 3-7-angled, pinnatifid or lobed. Flowers red, in tomentose panicles. Berries 0.8-1 cm in diam., subglobose, 2-3-seeded. Seeds ovoid-oblong, furrowed.

Reported from Pavagadh; very rare.

FLS : Mar.-May *FRS* : Apr.-July

CAYRATIA A. L. Juss. nom. cons.

Key to species

1. Leaves 3-foliolate; stipules minute, linear or ovate; leaflets 3-8×2-4 cm, broadly ovate, elliptic or nearly orbicular, rarely obovate; berries 0.6-1 cm across, 2-4-seeded; seeds triangular-cuneate, rugose on dorsal surface.. ..*C. carnosa*

1. Leaves 5-foliolate; stipules foliaceous, auricled; leaflets 8-14×3.5-11 cm, obovate or rhomboidal; berries 1.5-2.5 cm across, 1-seeded. Seeds ellipsoid or subglobose, not rugose .. .. *C. auriculata*

Cayratia auriculata (Roxb.) Gamble, Fl. Madras Pres. 237. 1918; S & J 15. *Cissus auriculata* Roxb. Fl. Ind. 1:130. 1820. *Vitis auriculata* Wall Cat. 6031. 1828 (nomen); FBI 1:658; C 1:273.

An extensive, woody, somewhat succulent, tendril climber. Leaflets obovate or ovate-rhomboidal, glabrous above, pubescent beneath. Flowers greenish-white, in 5-7.5 cm broad, branched cymes. Berries deep-purple to almost black when ripe, smooth.

Bulsar, Chhotaudepur and Saurashtra, occasional; trailling in absence of support.

FLS & FRS : Aug.-Jan.

Cayratia carnosa (Lam.) Gagnep. Lecomte Not. Syst. 1:347. 1911; Ch & O 64; S & J 15. *Cissus carnosa* Lam. Encycl. 1:31. 1783. *Vitis carnosa* Wall. ex W. & A. Prodr. 127. 1834; FBI 1:654; (excl. syn. *Cissus auriculata* Roxb.). *Vitis trifolia* C 1:271 et al. auct. (non L. 1753).

Slender, herbaceous climbers, somewhat woody at base. Leaflets glaucous-green, ovate-elliptic or obovate, thinly pubescent. Flowers greenish-white, in 4-6 cm broad, branched cymes. Berries globose, glabrous, deep-purple.

Throughout on hedges, old walls and low shrubs or trees; common. (KHAT-KHATUMBO)

FLS & FRS : July-Oct.; fruits seldom upto December.

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CISSUS L.

Key to species

1. Stem succulent, glabrous, 4-angled, jointed, angles winged; tendrils unbranched; leaves entire or lobed, 2.5–7×1–4.5 cm, glabrous; seeds ellipsoidal .. .. *C. quadrangulare*

1. Stem not fleshy or jointed, tomentose in young plants; tendrils branched; leaves not lobed, almost tomentose beneath, 5-30×3.5-27 cm; seeds obovate .. .. .. *C. repanda*

Cissus quadrangulare L. Mant. 39. 1767; WI 2:184; S & J 15. *Vitis quadrangularis* Wall. Cat. 5992. 1828 (nomen); FBI 1:645; C 1:266.

Succulent, tendril climbers. Leaves ovate to suborbicular, glaucous-green, fleshy. Flowers greenish-white or creamy-white in leaf-opposed cymes. Berries 0.4-0.7 cm in diam., ellipsoidal or ovoid, glabrous, purple.

In all zones, on hedges at some places; not common. (HADSANKAL)

FLS : June-Oct. *FRS :* Aug.-Dec.

Cissus repanda Vahl, Symb. Bot. 3:18. 1794; S & J 15; S 45. *Vitis repanda* W. & A. Prodr. 7:125. 1834; FBI 1:648 (excl. *C. vitiginea* L.); C 1:267.

A large, woody climber, with fissured, corky bark and vinaceous-purple, stem and branches in younger parts; tendrils with flattened discs. Leaves broadly ovate or orbicular, pubescent above, silky-tomentose beneath. Flowers and/or fruits not seen.

In deciduous forests, on trunks of trees, in absence of support trailing; occasional. (GANDAVELO; SIARJI DHRAL)

LEEACEAE

LEEA D. Royen ex L. nom. cons.

Key to species

1. Leaves simple.. .. ..*L. macrophylla*

1. Leaves compound :

   2. Leaves 1-pinnate, seldom basal leaflets or leaflet pairs compound :

      3. Leaflets ovate or ovate-elliptic, acuminate; main nerves close .. .. *L. edgeworthii*

      3. Leaflets broadly or narrowly elliptic-oblong, acute, subacute, acuminate or obtuse; main nerves distant .. .. *L cinerea*

   2. Leaves 2(–3)-pinnate . .. . *L. indica*

Leea cinerea Laws. in Hk. f. FBI 1:665. 1875. *Leea latifolia* Wall. ex Cl. in Trim. Journ. Bot. 138. 1881; C 1:277. *Leea coriacea* Laws. in Hk. f. FBI 1:665. 1875.

Erect, stout shrubs. Leaflets 5, 10–43.5×4–27 cm, sessile or subsessile, glabrous above, pubescent beneath, slightly inequilateral at base. Flowers white, in 12-30 cm broad, panicled cymes. Fruits not seen.

South Gujarat (Sanjan-forests of Manekpur-Vadali); only one plant seen by the author.

FLS : Aug.

Leea edgeworthii Santapau in Rec. bot. Surv. India 16(1) (ed. 1) : 54.1953; WI 6:57. *Leea aspera* Edgew. in Trans. Linn. Soc. London 20:36. 1841; FBI 1:665; C 1:277 (non Wall. in Roxb. Fl. Ind. 2:468. 1832).

1.5-2.5 m tall shrubs. Leaves 9-20 cm long; leaflets 5-7, 6.5-20×5-10 cm, glabrous or sparsely hairy above, finely pube-

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scent beneath. Flowers white or with a pinkish-tinge, in 12–30 cm broad, leaf-opposed, trichotomous cymes. Berries 4–6-lobed, 0.4–1.2 cm across, subglobose, deep-purple or nearly black.

In deciduous forests in south and central Gujarat; not frequent.

FLS & FRS : Aug.–Sep.; fruits upto November.

Leea indica (Burm. f.) Merrill in Phil. Journ. Sci. Bot. 14:245. 1919; WI 6:56; S & J 15; S 47. *Staphylea indica* Burm. f. Fl. Ind. 75. t. 24. f. 2. 1768. *Aquilicia sambucina* L. Mant. 2:211. 1771. *Leea sambucina* (L.) Willd. Sp. Pl. 1:1177. 1797; FBI 1:666; C 1:277.

1–1.2 m tall undershrubs, with greenish-brown, smooth bark. Leaves 18–40 cm long; leaflets 8.5–18.5×4.3–8.6 cm, oblong or elliptic-oblong, glabrous. Flowers white, in 6–10 cm broad, leaf-opposed cymes. Berries 0.5–0.9 cm across, depressed-globose, 2–6-lobed, glabrous, smooth, dark-purple to almost black.

In deciduous forests in south Gujarat and Saurashtra; not common. (Hatbani)

FLS : Aug.–Sep. *FRS* : Aug.–Dec.

Leea macrophylla Roxb. ex Hornem. Hort. Hafn. 1:231. 1813; Roxb. Fl. Ind. 1:654. 1832; FBI 1:664 (excl. syn. *L. latifolia* Wall.); C 1:276; WI 6:56; S & J 16.

50–130 cm tall, suffrutescent, stout herbs. Leaves 25–66 ×16.5–45 cm, broadly ovate or suborbicular, glaucous-green, glabrous above, pubescent beneath. Flowers white, in 5–15 cm broad cymes. Berries 0.3–0.4 cm across, 4–6-lobed, glabrous or nearly so, deep-purple to almost black.

In deciduous forests in south and central Gujrat; occasional in forest undergrowth.

FLS & FRS : Aug.– Oct.

SAPINDACEAE

Key to genera

1. Tendril climbers; leaves compound, 2(-3)-ternate; fruit an inflated capsule ... . *Cardiospermum*
1. Trees or shrubs, etendrillar; leaves simple or compound but not ternate; fruit not as above :
   2. Leaves simple, oblancolate; capsule membranous; valves winged; seeds exarillate .. ..*Dodonaea*
   2. Leaves compound; leaflets obovate or obovate-oblong, lanceolate or elliptic-lanceolate; fruit indehiscent, wingless :
      3. Petals absent; fruit minutely echinate, not lobed and not separating into cocci .. .. .. *Schleichera*
      3. Petals present; fruit not echinate, lobed, separating into cocci .. .. *Sapindus*

CARDIOSPERMUM L.

Key to species

1. Valves of capsule winged .. .. .. *C. halicacabum*
1. Valves of capsule not winged .. .. .. *C. canescens*

Cardiospermum canescens Wall. Pl. As. Rar. 1:14. 1830; FBI 1:670; C 1:281.

Reported from Devagadh Baria forests in Panchmahals by Dr. Bedi (1969).

Cardiospermum halicacabum L. Sp. Pl. 366. 1753; FBI 1:670; C 1:280; WI 2:75; Bor 259; Ch & O 65; S & J 16.

Slender, glabrous or sparsely hairy herbs, with stiff, axillary, 3–fid tendrils. Leaves alternate, petiolate; leaflets 0.6–7.5 × 0.3–1.6 cm, ovate, ovate-lanceolate or elliptic, glabrous or sparsely hairy. Flowers white, minute, in terminal cymes on tendrils. Capsule 1.2–2.3 cm broad, trigonously pyriform, bladdery, 3-valved, winged. Seeds globose, smooth, black, arillate.

Throughout on hedges and forest undergrowth; common.

FLS & FRS : July–Feb.

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DODONAEA L.

Dodonaea viscosa (L.) Jacq. Enum. Pl. Carib. 19. 1760; FBI 1:697; C 1:287; Bor 260; WI 3:97. f. 57; S & J 16; S 49. *Ptelea viscosa* L. Sp. Pl. 118. 1753.

1–2 m tall, evergreen shrubs. Leaves 3.5–10 × 1.5–2.5 cm, subsessile, glabrous. Flowers greenish–yellow, few, in axillary cymes. Capsule 1.5–2 cm across, membranous, winged.

Planted as a hedge at some places. (LAKHMI, JAKHAMI, VILAYTI MENDHI)

FLS & FRS : Sep.–Mar.

SAPINDUS L.

Key to species

1. Leaflets lanceolate, ovate-lanceolate or elliptic–lanceolate, acuminate, glabrous and shining above, sparsely hairy beneath; petals softly hairy within; fruit rufous-velvety atleast when young, of 3 connate druplets .. .. .. *S. laurifolius*

1. Leaflets broadly ovate–oblong, elliptic–oblong or obovate–oblong, emarginate or obtuse, dull and hairy on nerves above, pubescent beneath; petals glabrous within, except for a few hairs on claw; fruit sparsely hairy, of 3 druplets, connate half their length .. .. *S. emarginatus*

Sapindus emarginatus Vahl, Symb. Bot. 3:54. 1794; Ch & O 65; S & J 16. *Sapindus laurifolius* Vahl var. *emarginatus* Cooke, Fl. Pres. Bombay 1:269. 1902 & 284. 1958. *Sapindus trifoliatus* auct. non L.; FBI 1:682 *p. p.*

This species is very similar to *S. laurifolius* Vahl but it differs from the latter in certain characters (see key).

Planted at some places. (ARITHA)

FLS : Sep.–Dec. *FRS* : Nov.–Dec.

Sapindus laurifolius Vahl, Symb. Bot. 3:54. 1794; C 1:284; Bor 261; S & J 16. *Sapindus trifoliatus* auct. non L.; FBI 1:682 *p. p.*

5–10 m tall trees, with longitudianlly fissurred, rough, brown bark. Leaves 8–15 cm long: leaflets 5–7, 5–13×3–5 cm, shortly petiolulate. Flowers white, in 9–12 cm long, terminal, rusty–brown–tomentose panicles. Fruits 2–3-lobed, 1–2.5 cm across. Seeds globose, smooth, black.

Planted near houses at some places; sparingly wild. (ARITHA, ARITHI)

FLS : Sep.–Dec. *FRS* : Nov.–Mar.

SCHLEICHERA Willd. nom. cons.

Schleichera oleosa (Lour.) Oken. Alleg. Naturg. 3(2):1341. 1841; S & J 16; S 48. *Pistacia oleosa* Lour. Fl. Cochinch. 2:615. 1790. *Schleichera trijuga* Willd. Sp. Pl. 4(2):1096. 1805; FBI 1:681; C 1:283.

Deciduous trees, 10–15 m tall, with smooth, grey bark. Leaves 6–20 cm long; leaflets in 2–4 pairs, 4–30 × 2–11 cm. elliptic or elliptic–lanceolate or elliptic–oblong, glabrous. Flowers creamy–white or pale–yellow, fascicled, in 6–12.5 cm long, axillary or extra–axillary, interrupted racemes or panicles. Fruit 1–1.8 × 0.5–0.8 cm, ovoid, dark–brown, glabrous. Seeds oblong, smooth, glabrous.

In deciduous forests in south and central Gujarat and Saurashtra; occasional. (KOSUMDI, KUSUM, KOSIMB, KOSIM, KUHUM)

FLS : Feb.–Apr. *FRS* : Mar.–May

ANACARDIACEAE

Key to genera

1. Leaves simple :
   2. Carpels 5–6, free; stamens 10; flowers bisexual; drupe hard, obliquely lenticular.. .. .. *Buchanania*
2. Carpels united; flowers polygamo–dioecious; stamens 1–10; fruit fleshy drupe or nut :
   3. Flowers creamy–white or greenish–yellow; stamens 1–5 or 5–6; nut not seated on an enlarged receptacle :

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4. Leaves lanceolate, glabrous, crowded at ends of branches; stamens 1-5 but only 1 fertile and longest; style 1; fruit a drupe .. .. *Mangifera*

4. Leaves obovate-oblong or elliptic-oblong, not crowded at ends of branches, grey-tomentose beneath; stamens 5-6; styles 3; fruit a nut.. ..*Semecarpus*

3. Flowers pale-to bright pink; stamens 8-10 (mostly 9); nut seated on enlarged, fleshy raceptacle.....*Anacardium*

1. Leaves compound :

5. Leaflets more than 3 :

6. Drupe 0.6-1.8 cm long, ellipsoid-oblong or subreniform, red or reddish-brown when ripe .. .. .. *Lannea*

6. Drupe 4-4.5 cm long, ovoid, yellow when ripe .. .. *Spondias*

5. Leaflets 3 .. .. *Rhus*

ANACARDIUM Rottb.

Anacardium occidentale L. Sp. Pl. 383. 1753; FBI 2:20; C 1:292; WI 1:70; S 50.

4-6 m tall, evergreen trees, with light-black, rough, shallowly longitudinally fissurred bark. Leaves 6-19.5×3.5-9.5 cm, obovate-oblong or elliptic-obovate, glabrous, coriaceous. Panicles 5-20 cm long, terminal. Nuts 2-3 cm long, reniform, pale-greenish-yellow, at times dark-purple.

Planted at some places; also grown by the forest department in some forest divisions on experimental basis; native of Tropical America. (KAJU)

FLS & FRS : Sep.-Apr.

BUCHANANIA Spreng.

Buchanania lanzan Spreng. in Schrad. Journ. 4:234. 1801; C 1:293; WI 1:233. *Buchanania latifolia* Roxb. Hort. Beng. 32. 1814 (nomen) & Fl. Ind. 2:385. 1832; FBI 2:23.

5-16 m tall trees, with rough, blackish-brown bark. Leaves 9-30×3.5-11 cm, glabrous above, silky-pubescent to villous beneath, elliptic-oblong. Flowers creamy-white, in 6.5-35 cm long, terminal and axillary, pubescent, pyramidal panicles. Drupes 0.6-1.2 cm long, chestnut brown, smooth, glabrous, single-seeded.

In deciduous forests of Dangs, Rajpipla, Chhotaudepur and Panchmahals; occasional. (CHAROLO, CHAROLI)

FLS : Dec.-Apr. *FRS* : Jan.-Apr.

LANNEA A. Rich. *nom. cons.*

Lannea coromandelica (Houtt.) Merrill in Journ. Arn. Arb. 19: 353. 1939; WI 6:27; S & J 16; S 51. *Dialium coromandelicum* Houtt. Nat. Hist. (Ser. II) 2:39. t. 5. f. 2. 1774. *Heberlia grandis* Dennst. Hort. Malab. 30. 1818. *Odina wodier* Roxb. Hort. Beng. 29. 1814 (nomen) & Fl. Ind. 2:293. 1832; FBI 2:29; C 1:296 *(sphalm woodier)*. *Lannea grandis* (Dennst.) Engler in Pfam. Nachtr. 1:213. 1897; Bor 267.

10-15 m tall, deciduous trees, with greyish-white or ash-coloured, bark, sometimes with black patches. Leaves 12-28 cm long, crowded at ends of branches; leaflets 5-11; 1.2-12.3×0.9-5 cm, ovate, elliptic-oblong or elliptic-lanceolate, glabrous, membranous. Flowers minute, yellowish, tinged red, sessile, in 8-20 cm long panicles at ends of leafless branches. Drupes smooth, glabrous.

Throughout, occasional. (MADHOL, MODHAD, MINIYO, MOYNO)

FLS : Jan.-June *FRS* : Feb.-July

MANGIFERA L.

Mangifera indica L. Sp. Pl. 200. 1753; FBI 2:13; C 1:291; Bor 266; WI 6:265. Pl. 11 (Col.) & ff. 90-91; Ch & O 66; S & J 16.

15-20 m tall, evergreen trees, with light-black or blackish-brown, rough, longitudinally fissurred bark. Leaves 9-32×2.4-8

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cm. Flowers small, numerous, in 10-25 cm long, terminal panicles, Drupes variable in size and shape, yellow to reddish-yellow when ripe. Seeds 2 5-6 × 1-4 cm or more in size, oblong, glabrous, smooth.

Throughout; several varieties such as Afus, Payari, Langdo, Malgubba, Totapuri, Dasheri, Kesar and Ladvo are planted. (KERI, AMBO)

FLS : Dec.-May *FRS* : Feb.-July

RHUS L.

Rhus mysurensis Heyne ex W. & A. Prodr. 172. 1834; FBI 2:9; C 1:290; S & J 16.

Small trees or large shrubs, often spiny and with acrid juice. Leaflets obovate-cuneate, softly pubescent. Flowers polygamous, in terminal and axillary panicles. Drupes 0.3-0.5 cm across, subglobose, brown, glabrous

Listed by Santapau (1962) from Saurashtra. (DASAN, DASNI, DASARNI, DAVAN)

FLS : June-Aug.

SEMECARPUS L. f.

Semecarpus anacardium L. f. Suppl. 182. 1781; FBI 2:30; C 1:296; Bor 266 & 267; S 51.

5-8 m tall trees. Leaves 6.5-33×4.5-16 cm, coriaceous, glabrous or sparsely hairy above. Panicles 15-30 cm long, terminal, grey-tomentose. Nuts 1.5-2.5×1.5-1 8 cm, reniform, dark-brown or nearly black, straight or oblique on receptacle.

Dangs; Cooke lists it from Gujarat. (BIBBA, BHILVA, BILVA, BHILAMO)

FLS & FRS : July-Dec.

SPONDIAS L.

Spondias pinnata (L. f.) Kurz in Pegu Rep. A. 44. 1875. *Mangifera pinnata* L. f. Suppl. 156. 1781. *Spondias mangifera* Willd. Sp. Pl. 2:759. 1799; FBI 2:42; C 1:299.

10-12 m tall trees, with grey, smooth bark. Leaves 30-45 cm long; leaflets 7-11, subopposite or alternate, 7.5-15×3-6 cm, elliptic or elliptic-lanceolate, glabrous. Flowers 0.5-0.6 cm across, creamy-white, in 15-30 cm long panicles at ends of leafless branches.

In deciduous forests at Dangs and Panchmahals; Cooke remarks, "Gujarat-widely planted", but this information could not be verified. (AMBADA, AMBADO)

FLS : Dec.-Mar. *FRS* : Nov.

MORINGACEAE

MORINGA Lam.

Key to species

1. Leaves 3-pinnate; leaflets 0.6-1.5×0.5-0.9 cm; veins not distinct; flowers white or creamy-white, mostly planted or self-sown .. .. *M. oleifera*

1. Leaves 2-pinnate; leaflets 1.5-3×0.8-1.5 cm; veins distinct; flowers white or creamy-white and mostly with red tinge; wild .. .. *M. concanensis*

Moringa concanensis Nimmo in Grah. Cat. Bombay Pl. 43. 1839; FBI 2:45; C 1:301; WI 6:429; S & J 16.

8-10 m tall trees, with rough, greyish-brown trunk. Leaves 25-40 cm long; leaflets 17-21, broadly elliptic or suborbicular, rarely obovate, glabrous. Panicles and fruit as in *M. oleifera* Lam.

Throughout, rare. (JANGLI SARAGAVO, KADVO SARAGAVO, DUNGRAU SARAGAVO)

FLS & FRS : Oct.-Dec.

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Moringa oleifera Lam Encycl. Meth. Bot. 1:398. 1785; WI 6:425. ff. 164-165; Ch & O 66; S & J 16. *Moringa pterygosperma* Gaertn. Fruct. 2:314. 1791; FBI 2:45; C 1:301.

5–10 m tall, deciduous trees, with rough, greyish-brown, corky bark. Leaves 15-40 cm long; leaflets ovate, obovate or oblong, glabrous. Panicles 10–25 cm long, axillary or at ends of branches. Capsule 30-60 cm long, pedulous, subtorulose, deeply striate. Seeds 1-1.5 cm long, triangular, winged on angles, glabrous.

Planted or self-sown, near houses, throughout. (SARAGVO, MITTHO SARAGAVO)

FLS & FRS : Throughout the year.

PAPILIONACEAE

Key to genera

1. Plants erect, suberect or prostrate, but not climbing or twining :
   2. Trees :
      3. Leaflets 3 ;
         4. Plants unarmed; pods flat, not torulose :
            5. Flowers orange-red or salmon-coloured .. .. *Butea*
            5. Flowers white with purple tinge .. .. *Ougeinia*
         4. Plants armed; pods subterete torulose.. .. *Erythrina*
      3. Leaflets more than 3 :
         6. Pods many-seeded :
            7. Flowers not more than 2 cm long; pods linear; leaflets 9-21.. .. .. .. *Gliricidia*
            7. Flowers more than 2 cm long; pods tetragonous or subtetragonous; leaflets 15-30 pairs .. .. *Sesbania*
         6. Pods 1–4-seeded :
            8. Leaflets opposite; calyx dark-reddish-purple; pods often woody.. .. .. .. *Derris*

            8. Leaflets alternate; calyx not as above; pods not woody :
               9. Flowers creamy-white; pods oblong or strap-shaped, not winged.. .. .. *Dalbergia*
               9. Flowers yellow; pods usually orbicular, winged.. .. .. *Pterocarpus*
   2. Shrubs, undershrubs or herbs :
      10. Flowers white, creamy-yellow, pure-yellow or spotted purple :
         11. Corolla white or with reddish nerves :
            12. Flowers in racemes.. .. .. .. *Lupinus*
            12. Flowers axillary, solitary .. .. .. *Lotus*
         11. Corolla creamy-yellow, yellow or spotted purple :
            13. Pods turgid :
               14. Leaves not gland-dotted beneath.. *Crotalaria*
               14. Leaves gland-dotted beneath.. .. *Moghania*
            13. Pods not turgid :
               15. Joints of pods echinate; leaves bifoliolate; bracts and stipules foliaceous.. .. *Zornia*
               15. Pods jointed or not; bracts and stipules as above :
                  16. Pods boat-shaped.. .. .. *Elliotis*
                  16. Pods not boat-shaped :
                     17. Leaves simple.. .. .. *Goniogyna*
                     17. Leaves compound :
                        18. Leaves 3-foliolate :
                           19. Shrubs.. .. .. *Cajanus*
                           19. Herbs :
                              20. Pods falcate or of 2–4 spirals.. .. *Medicago*
                              20. Pods not as above :
                                 21. Stamens monadelphous.. .. *Rothia*
                                 21. Stamens diadelphous :
                                    22. Leaves digitately 3-foliolate .. .. *Trifolium*

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22. Leaves pinnately 3-foliolate :
    23. Calyx accrescent, silvery-hairy outside; flowers solitary or 2-3- fascicled; pedicel deflexed .. .. *Psoralea*
    23. Calyx and pedicels not as above; flowers in racemes :
        24. Racemes long; pods short globose, subglobose, ellipsoid or ovoid.. .. .. .. *Melilotus*
        24. Racemes short, often congested; pods elongate, straight or falcately recurved .. .. *Trigonella*

18. Leaves more than 3-foliolate :
    25. Leaflet pairs 2 :
        26. Pods geocarpic; stamens 9+1 .. .. *Arachis*
        26. Pods not geocarpic; stamens monadelphous .. .. *Geissaspis*
    25. Leaflets more than 2 pairs :
        27. Pods very long, narrow-linear, septate between seeds, but not jointed.. .. .. *Sesbania*
        27. Pods relatively much shorter, often jointed; if not jointed, pod turgid :
            28. Stamens 5+5; pod jointed :
                29. Joints of pods folded inside the calyx .. .. *Smithia*
                29. Joints of pods not as above; pod exserted.. .. .. *Aeschynomene*
            28. Stamens 9+1; pod turgid.. .. *Astragalus*

10. Flowers red, reddish-purple, bluish-purple, mauve or blue :
    30. Plants armed.. .. .. *Alhagi*
    30. Plants unarmed :
        31. Pods falcate or sickle-shaped or of 2-4 spirals.. .. .. *Medicago*
        31. Pods not as above :
            32. Pods jointed :
                33. Joints of the pod echinate .. .. *Taverniera*

33. Joints of the pod not echinate :
    34. Joints of pod not folded one above the other :
        35. Joints of the pod tumid .. .. *Alysicarpus*
        35. Joints of the pod flat.. .. .. *Desmodium*
    34. Joints of pods folded one above the other.. *Uraria*

32. Pods not jointed :
    36. Pods flat :
        37. Plants viscidly pubescent .. .. *Pseudarthria*
        37. Plants not viscidly pubescent.. .. *Clitoria*
    36. Plants not as above; pods not flat; if flat, leaves simple:
        38. Pods obliquely turgid.. .. .. *Moghania*
        38. Pods not obliquely turgid :
            39. Leaves simple :
                40. Pods 1-seeded.. .. .. *Psoralea*
                40. Pods more than 1-seeded :
                    41. Inflorescence mostly axillary; flowers red; pods torulose, cylindric or obscurely 4-gonous .. .. *Indigofera*
                    41. Inflorescence mostly leaf-opposed, axillary or extra-axillary; flowers blue to bluish-purple; pods flat .. .. *Tephrosia*
            39. Leaves 3 or more-foliolate :
                42. Anthers apiculate; hairs medi-fixed :
                    43. Flowers red; pods not subtetragonous .. .. .. *Indigofera*
                    43. Flowers lilac or bright-rosy purple, rarely white; pods subtetragonous.. .. .. *Cyamopsis*
                42. Anthers muticous; hairs basifixed .. .. *Tephrosia*

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1. Plants climbing or twining :
   44. Leaflets modified into tendrils (seldom tendrils absent in *Vicia*) :
      45. Plants glandular-pubescent .. .. .. *Cicer*
      45. Plants not as above :
         46. Stipules foliaceous .. .. .. *Pisum*
         46. Stipules not foliaceous :
            47. Leaflets 5, all or upper 3 modified into tendrils; style bearded down on the inner face .. .. *Lathyrus*
            47 Leaves with or without tendrils; style bearded in tuft or a ring at apex .. *Vicia*
   44. Leaflets not modified into tendrils :
      46. Sepals persistent, foliaceous, creamy-white or pale-yellow .. .. *Cylista*
      46. Sepals not as above :
         47. Leaves more than 3-foliolate :
            50. Plants woody twiners :
               51. Pods constricted between the seeds, linear or linear-oblong, 2-5-seeded .. .. *Millettia*
               51. Pods not constricted between the seeds, strap-shaped, mostly 1-seeded, rarely 2-4-seeded :
                  52. Leaflets alternate.. ..*Dalbergia*
                  52 Leaflets opposite.. .. ..*Derris*
            50. Plants herbaceous twiners :
               53. Flowers in racemes .. .. *Abrus*
               53. Flowers solitary or geminate, axillary .. ..*Clitoria*
         49. Leaves 3-foliolate :
            54. Pods rufous-pubescent, flat linear-oblong; seed 1 towards one end of pod.. ..*Butea*
            54. Pod not as above, more than 1-seeded :

47. Leaves 3-foliolate ....

   55. Flowers creamy-yellow, yellow or tinged red, (standard dark-purple in *Rhynchosia rothii*) :
      56. Leaves gland-dotted beneath :
         57. Corolla not more than 1 cm long; seeds 1-2 .. .. ..*Rhynchosia*
         57. Corolla more than 1 cm long; seeds 3 or more :
            58. Corolla upto 1.8 cm long; pods faintly or deeply constricted between seeds; seeds strophiolate....*Alysicia*
            58. Corolla 2.5 cm long or longer; Pods with faint lines (but not constricted) between seeds; seeds estrophiolate .. .. *Dunbaria*
      56. Leaflets not gland-dotted beneath :
         59. Stipules not prolonged below the point of insertion; keel in a spiral of 1-5 complete turns; stigma elongated and internal or sometimes very short and terminal or subterminal; style without any apical appendage .. *Phaseolus*
         59. Stipules prolonged below the point of insertion; keel erect-incurved, rarely making almost 1 complete spiral turn; style ending beyond the stigma in a more or less distinct beak.. ..*Vigna*
   55. Flowers white, bright-rosy-purple, mauve, bluish-purple or blue :
      60. Pods turgid; flowers bright-rosy-purple .. .. *Canavalia*
      60. Pods flat, constricted between seeds; flowers bluish-purple .. .. *Pueraria*
      60. Pods not turgid, if flat not constricted :
         61. Racemes of few flowers, congested mostly at apex :
            62. Style conspicuously flattended .. .. *Lablab*

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62. Style not flattened :

63. Style not bearded; pods flat.. .. ..*Dolichos*

63. Style bearded below the stigma; pods cylindric, terete or subterete.. .. .. ..*Vigna*

61. Racemes of flowers lax :

64. Racemes drooping; flowers mauve or dark-purple; pods S-shaped; stamens diadelphous.. ..*Mucuna*

64. Racemes erect; flowers purple, red, pale-blue or white; pods not as above; stamens monadelphous :

65. Alternate anthers sterile; pods straight or curved, shortly beaked (beak almost at right angles); seeds 2-9, reddish-brown or dark-brown .. .. *Teramnus*

65. Alternate anthers not sterile; pods straight, not beaked; seeds 1-4, yellowish .. *Glycine*

ABRUS Adans.

Abrus precatorius L. Syst. (ed. 12) 472. 1767; FBI 2:175; C 1: 382; Ch & O 82; S & J 16. *Glycine abrus* L. Sp. Pl. 753. 1753.

Perennial, deciduous twiners, woody at base. Leaves 8–12 cm long: leaflets 0.5-1.7 × 0.3-0.8 cm, oblong or elliptic-oblong, glabrous above, appressed-hairy beneath Flowers pinkish-purple or lilac, in 3–7.5 cm long, compact racemes. Pods 2-4 × 0.8-1.5 cm, pubescent, linear-oblong, mucronate. Seeds subglobose, oblong or ovoid, shining, about 2/3 scarlet and 1/3 black, smooth, glabrous.

Throughout on hedges and low shrubs in forests. (CHANOTHI)

FLS & FRS : July-Dec., dry fruits upto February

AESCHYNOMENE L. nom. cons.

Aeschynomene indica L. Sp. Pl. 713. 1753; FBI 2:151; C 1:363; WI 1:35; S & J 16.

Erect or suberect, suffruticose, glabrous herbs. Leaves 4–16 cm long; leaflets 15-45 pairs, 0.3-0.8 × 0.1-0.4 cm, linear to linear-oblong, obtuse or subacute and minutely mucronate at apex, rounded and inequilateral at base. Flowers pale-to creamy-yellow, few, in axillary, lax, 1–6 cm long racemes. Pods 2-4.5 × 0.2-0.4 cm, 6–10-jointed, straight or slightly falcate, somewhat woody, glabrous, minutely red-dotted.

Throughout, in moist places; common.

FLS : Aug.-Oct. *FRS* : Sep.-Jan.

ALHAGI Tourn. ex Adans.

Alhagi pseudalhagi (M. Bieb.) Desv. in Journ. de Bot. 1:120. 1813; Ch & O 69; S & J 16. *Hedysarum pseudalhagi* M. Bieb. Fl. Taur. Cauc. 2:174. 1808. *Alhagi camelorum* Fisch. Ind. Hort. Gorenk. (ed. 2) 72. 1812; C 1:355; WI 1:51. *Alhagi maurorum* Baker in Hk. f. FBI 2:145. 1876 (non Medic. 1787, nec Desv. 1813).

30–70 cm tall, armed, glabrous undershrubs. Leaves 0.5–1.8 × 0.2–0.5 cm, ovate-oblong or obovate, appressed-hairy. Flowers red, few, in short racemes on thorns. Pods 2–3 cm long, falcate, torulose, glabrous.

ALYSICARPUS Desv. nom. cons.

Key to species

1. Calyx shorter or very slightly longer than the first joint of the pod :
   2. Pods moniliform, veinless .. .. .. *A. monilifer*
   2. Pods not moniliform, veined :
      3. Calyx shorter than the first joint of the pod .. .. *A. procumbens*
      3. Calyx equaling or slightly longer than the first joint of the pod .. .. *A. vaginalis*

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1. Calyx much longer than the first joint of pod :
   4. Teeth of calyx imbricate in fruiting stage :
      5. Pods slightly monilifer, neither veined nor rugose.. .. .. *A. bupleurifolius*
      5. Pods monilifer, reticulately veined .. .. *A. longifolius*
      5. Pods transversely ribbed :
         6. Pods 4-gonous, exserted .. .. .. *A. tetrangonolobus*
         6. Pods not 4-gonous, not exserted :
            7. Stem finely pubescent or glabrous :
               8. Calyx hairy on the back.. .. .. *A. scariosus*
               8. Calyx glabrous .. .. *A. rugosus*
            7. Stem densely pubescent or villous.... *A. heyneanus*
   4. Teeth of the calyx not imbricate in the fruiting stage ;
      9. Flowers sessile.. .. .. *A. pubescens*
      9. Flowers pedicelled :
         10. Lower leaves 1-foliolate, upper 3-foliolate, more than 2.5 cm long.. .. .. .. *A. belgaumensis*
         10. Leaves simple, upto 2.5 cm long.. .. *A. racemosus*

Alysicarpus belgaumensis Wt. Icon. t. 92. 1840; FBI 2:160; C 1:372; Ch & O 72.

An erect, annual herb, 80–100 cm tall, appressed-hairy. Leaflets 1.8–7.5×1.2–2.2 cm, elliptic-oblong or oblong-lanceolate, appressed-hairy beneath, ciliate on margins. Flowers reddish-purple, in 10–20 cm long, lax, axillary and terminal racemes. Pods 1–1.4 cm long, slightly exserted, subcompressed, finely pubescent, 3–4-jointed, joints reticulately veined.

Pavagadh, rare among grasses on top of the hill.

FLS & FRS : Sep.-Oct.

Alysicarpus bupleurifolius (L.) DC. Prodr. 2:352. 1852; FBI 2:158; C 1:370; Ch & O 71; S & J 16; S 60. *Hedysarum bupleurifolium* L. Sp. Pl. 745. 1753.

Prostrate or suberect, 15–45 cm tall, glabrous herbs. Leaves 1.3–7.5×0.2–0.6 cm, sessile or subsessile, linear, linear-lanceolate, elliptic-lanceolate or elliptic-oblong, glabrous, Flowers reddish-purple, geminate, in 4–14 cm long, axillary and terminal, lax, spicate racemes. Pods 0.6–1.3 cm long, shortly exserted, apiculate, 4–7-jointed, joints smooth, glabrous. Seeds spherical, yellowish-brown, smooth, glabrous.

Throughout among grasses. (KHADSAMERVO)

FLS & FRS : Aug.-Oct.

Alysicarpus heyneanus W. & A. Prodr. 1:234. 1834. *Alysicarpus rugosus* (Willd.) DC. var. *heyneanus* (W. & A.) Baker in Hk. f. FBI 2:159. 1876; C 1:371.

Diffuse or suberect, densely pubescent or villous, 15–45 cm tall herbs. Leaves 1–4.5×0.4–2.3 cm, elliptic-oblong or obovate-oblong, pubescent beneath. Flowers reddish-purple, in terminal and axillary racemes. Pods 0.8–1.2 cm long, glabrous but for sparsely ciliate margins, 3–5-jointed, moniliform, apiculate, joints suborbicular, deeply transversely rugose. Seeds brown, ellipsoid, smooth, glabrous, obtuse at ends.

Kutch, Saurashtra, Rajpipla and Broach; rare among grasses and in cultivated fields.

FLS & FRS : Sep.-Dec.

Alysicarpus longifolius (Rottl. ex Spreng.) W. & A. Prodr. 233. 1834; FBI 2:159; C 1:370; Ch & O 72; S & J 16; S 60. *Hedysarum longifolium* Rottl. ex Spreng. Syst. 3:319. 1826.

Slender, erect, 25–150 cm tall, glabrous herbs. Leaves 1.4–7.2×0.6–3 cm, elliptic-oblong, ovate-oblong, ovate-lanceolate or linear-lanceolate, appressed-hairy beneath. Flowers bright-reddish-purple, geminate, in 5–35 cm long, spicate racemes. Pods 0.4–1.2 cm long, 3–6-jointed, reticulately veined, glabrous. Seeds globose, brown, smooth, polished.

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Throughout, common, along margins of cultivated fields, among grasses in waste lands and in hedges. (GHODASAMERVO, MOTOSAMERVO, UBHOSAMERVO, GHANULO).

FLS & FRS Sep.-Mar.

Alysicarpus monilifer (L.) DC. Prodr. 3:353. 1825; FBI 2:157; C 1:368; Ch & O 70; S & J 16. *Hedysarum moniliferum* L. Mant. 1:102. 1767.

Prostrate herbs, patently hairy, at length nearly glabrous. Leaves 0.4–2.5×0.2–1.2 cm, elliptic-oblong or obovate, glabrous but for hairy nerves beneath. Flowers bright-pinkish-purple, in 2.5–5.5 cm long, axillary and terminal racemes. Pods 1–1.6 cm long, 3-6-jointed, joints hairy, faintly reticulately veined. Seeds subglobose or oblong, dull-brown or smooth.

Throughout in plains (except Bulsar & Kutch).

FLS & FRS : Aug.-Feb.

Alysicarpus procumbens (Roxb.) Schindl. in Fedde Rep. 21:11. 1925; Ch & O 71; S & J 16. *Hedysarum procumbens* Roxb. Hort. Beng. 56. 1814 (nomen) & Fl. Ind. 3:345. 1832. *Alysicarpus hamosus* Edgew. in Journ. As Soc. Bengal 21:171. 1853; FBI 2:157; C 1:368.

Prostrate or procumbent, patently hairy herbs, often with radially spreading branches. Leaves 0.5-4.5×0.2–3.7 cm, broadly ovate-oblong or suborbicular, membranous, glabrous but for hairy nerves beneath. Flowers bright-reddish-purple, few, in terminal and axillary racemes. Pods 0.7–2.5 cm long, compressed, 2–5-jointed, hairy, reticulately veined. Seeds glabrous, smooth, brown, nearly spherical.

Throughout, among grasses, in cultivated fields and along roads and railway lines.

FLS & FRS : July–Feb.

Alysicarpus pubescens Law ex Wt. Icon. t. 250. 1838–40; FBI 2:160; C 1:372; S & J 16.

Erect, patently softly hairy herbs, 80–120 cm tall. Leaves 2–3.6×1.2-1.6 cm, linear-oblong or oblong-lanceolate, subglabrous above, hairy beneath, nerves and margins ciliate. Flowers reddish-purple, in 5–16 cm long, villous spikes. Pods 0.4–0.6 cm long, monilifer, 3–4-jointed, joints globose, reticulate, glabrous.

Cooke (1958) lists it from Broach and Santpau (1962) from Saurashtra.

FLS & FRS : Sep.-Dec.

Alysicarpus racemosus Bth. in Linnaea 25:642. 1851; S & J 16. *Alysicarpus belgaumensis* Wt. var. *racemosus* (Bth.) Baker in Hk. f. FBI 2:160. 1876.

Erect, densly hairy herbs. Leaves 0.8–2.5×0.7–1.8 cm, broadly elliptic, obovate or suborbicular, pubescent beneath. Flowers bright-rosy-purple, in 10.5–15 cm long, terminal and axillary racemes. Pods 0.4–0.8 cm long, moniliform, 3–4-jointed, joints subcompressed, reticulately veined.

Listed by Santapau (1962) from Saurashtra on the authority of Thaker J. I.

FLS & FRS : Sep.–Oct.

Alysicarpus rugosus (Willd.) DC. Prodr. 2:303. 1825; FBI 2:159; C 1:371. *Hedysarum rugosum* Willd. Sp. Pl. 3:1172. 1802.

Prostrate or suberect, glabrous herbs. Leaves 1.4–4.5×0.4–0.7 cm, oblong, rarely orbicular or linear-lanceolate, appressed-hairy beneath. Flowers reddish-purple in 1.2–3 cm long, compact, spicate racemes. Pods 0.7–1 cm long, 3–6-jointed, joints glabrous, transversely ribbed.

Broach district (Kabirvad, Madhi, Shukaltirth) among grasses; rare.

FLS & FRS : Dec.

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Alysicarpus scariosus (Rottl. ex Spreng.) Grah. ex Thw. Enum. Pl. Zeyl. 88. 1858; Ali in Biol. 12:32. 1966. *Hedysarum scariosum* Rottl. ex Spreng. Syst. Veg. 3:319. 1826. *Hedysarum glumaceum* auct. non L.; Roth, Nov. Pl. Sp. 355. 1821. *Alysicarpus styracifolius* auct. non DC. 1825; S & J 16. *Alysicarpus rugosus* (Willd.) DC. var. *styracifolius* Baker in Oliver, Fl. Trop. Afr. 2:171. 1871; FBI 2:159; C 1:371.

Diffuse, finely pubescent, 20–45 cm tall herbs. Leaves 0.8–6.7×0.4–3.2 cm, elliptic-oblong, hairy beneath, petiolate. Flowers reddish-purple, in 1–2.5 cm long, axillary, compact racemes. Pods 0.6–0 9 cm long, glabrous, 3–5-jointed, joints transversely rugose. Seeds ellipsoid to ellipsoid-oblong, glabrous, smooth, brown.

Throughout a weed along roads and railway. lines, in cultivated fields and among grasses in waste lands. (RUCHHALO SAMERVO).

FLS & FRS : Sep.–Jan.

Alysicarpus tetragonolobus Edgew. in Journ. As. Soc. Bengal 21:169. 1853; FBI 2:159; C 1:372; Ch & O 71; S & J 17.

Suberect or diffuse, slender, glabrous or sparsely hairy herbs. Leaves 1–4.2×0.5–1.4 cm, linear to linear-oblong or linear-lanceolate, glabrous above, appressed-hairy beneath, sessile. Flowers bright-reddish-purple, in 4–22 cm long racemes. Pods 0.5–1 cm long, subquadrangular, glabrous, apiculate, 2–6-jointed, joints transversely ribbed. Seeds ellipsoid to ellipsoid-oblong, smooth, glabrous, brown.

Throughout in plains (except Kutch); common among grasses. (SAMERVO)

FLS & FRS : Aug.–Nov.

Alysicarpus vaginalis (L.) DC. Prodr. 2:353. 1825; FBI 2:158; C 1:369; Ch & O 71; S & J 17; S 60. *Hedysarum vaginale* L. Sp. Pl. 746. 1753. *Alysicarpus nummularifolius* DC. Prodr. 2:353. 1825.

Alysicarpus vaginalis (L.) DC. var. *nummlarifolius* (DC.) Baker in Hk. f. FBI 2:158. 1876; C 1:369. *Alysicarpus vaginalis* (L.) DC. var. *stocksii* Baker in Hk. f. FBI 2:158. 1876; C 1:369.

Prostrate or suberect, glabrous or sparsely hairy herbs, often with radially spreading branches. Leaves 1–4.5×0.9–3.5 cm, ovate–oblong, elliptic–oblong or nearly orbicular, glabrous above, sparsely hairy beneath. Flowers purple or violet, in 3–7 cm long, terminal and axillary, lax or compact racemes. Pods 1.3–2.5 cm long, 6–8-jointed, reticulately veined, at length glabrous. Seeds ellipsoid-oblong, glabrous, brown, smooth.

Throughout, common.

FLS & FRS : July-Dec.

ARACHIS L.

Arachis hypogaea L. Sp. Pl. 741. 1753; FBI 2:161; C 1:435; WI 1:90. Pl. 16 (1, 4–5); Bailey 554; S & J 17.

Diffuse or suberect, patently hairy herbs. Leaves abruptly pinnate 4.5–5 cm long, alternate; leaflets 4, 1.5–7×0.8–2.8 cm, obovate–oblong, glabrous or sparsely hairy. Flowers yellow or orange, axillary, solitary. Pods 2–4-seeded, 2–6.5 cm long, glabrous, constricted between seeds, prominently reticulately veined. Seeds pinkish or red, glabrous, smooth, acute at one end.

Throughout; extensively cultivated in Saurashtra, on a much smaller scale in other parts; at times an escape in waste places. (MUNGFALI, MAGFALI, BHONYSING)

FLS : July–Oct. *FRS* : Aug.–Dec.

ASTRAGALUS L.

Astragalus prolixus Sieb. in Fl. Aegypt. Exsicc. ex Bunge Astr. 1:9 & 2:6. 1868–1869; FBI 2:121; C 1:351.

Diffuse, appressed-pubescent herbs. Leaves 1–3.1 cm long, alternate; leaflets 7–13, oblong or obovate-oblong, appressed-pubescent. Flowers sessile, yellowish with a pinkish tinge, 6–12,

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in axillary heads Pods 0.4–0 7 cm long, linear-oblong, turgid, straight, densely silky-pubescent. Seeds reniform, dark-brown, glabrous, smooth.

Kutch (Mundra) and Broach (Bhadbhut), rare.

FLS & FRS : Jan.

ATYLOSIA W. & A.

1. Plants erect .. .. *A. sericea*
1. Plants twining or trailing :
   2. Leaflets much longer than broad; pods 0.4–0.7 cm broad with deep lines between seeds .. .. .. *A. scarabaeoides*
   2. Leaflets as long as broad or broader than long; pods 1–1.5 cm broad with sharply defined but not deep-lines between seeds .. .. *A. platycarpa*

Atylosia platycarpa Bth. Pl. Jungh. 2:243. 1852; FBI 2:216; C 1:410; S & J 17.

Herbs, fulvous or grey-patent-hairy. Leaflets 2.5–5×1.7–4.9 cm, ovate to ovate-oblong, sparingly pilose. Flowers yellow, axillary, solitary or geminate. Pods 2.5–3 cm long, 4–6-seeded, fulvous-hairy, shortly beaked. Seeds oblong, compressed, dark-brown, glabrous, smooth.

South and Central Gujarat and Saurashtra, among grasses or on hedges; rare.

FLS & FRS : Aug.–Nov.

Atylosia scarabaeoides (L.) Bth. Pl. Jungh. 3:243. 1851–55; FBI 2:215; C 1:409; S & J 17. *Dolichos scarabaeoides* L. Sp Pl. 726. 1753.

Slender, appressed-pubescent herbs. Leaflets 2.5–5.5×2–3 cm, elliptic or ovate-oblong, nearly sessile, grey-pubescent. Flowers pale-to bright-yellow, solitary or few, in axillary racemes. Pods 1.2–1.5 cm long, elliptic-oblong, appressed-hairy, brown. Seeds ellipsoidal, black, smooth, glabrous, strophiolate.

Dangs, Rajpipla, Chhotaudepur, Panchmahals, Mahi ravines and Saurashtra, on hedges; not common.

FLS & FRS : Aug.–Dec.

Atylosia sericea Bth. MSS. ex Baker in Hk. f. FBI 2:213. 1876; C 1:408; S 72.

Shrubs. Leaflets 1–2.5×0.2–0.5 cm, oblanceolate, sessile or nearly so, densely silky-pubescent, prominently 3-nerved from base. Flowers yellow, axillary, solitary or paired on a very short pedicel. *Pod* 0.8–1 cm long, linear-oblong, turgid, oblique at apex, shortly beaked, slightly depressed between seeds, densely silky-grey-tomentose, two-seeded. Seeds 0.25–0.3 cm long, subcylindric, compressed, black, smooth, with a pale-brown strophiole.

Listed from Kawant range in Chhotaudepur forest division by Thaker et al. (1970).

FLS & FRS : Not mentioned.

BUTEA Koen. ex Roxb. nom. cons.

Key to species

1. Trees .. .. *B. monosperma*
1. Extensive woody twiners :
   2. Flowers 0.6–0.8 cm long; keel almost straight .. .. *B. parviflora*
   2. Flowers 4–4.5 cm long; keel incurved.. .. *B. superba*

Butea monosperma (Lam.) Taub. in Engl. & Prantl, Pfam. 3(3) : 366. 1894; WI 1:256. Pl. 26 (col.); Bor 92; Ch & O 88; S & J 17; S 66. *Erythrina monosperma* Lam. Encycl. Meth. Bot. 1:391. 1783. *Butea frondosa* Koen. ex Roxb in Journ As. Res. 3:469. 1792 & Pl. Cor. 1:21. t. 21. 1795; FBI 2:194; C 1:395.

5–20 m tall, deciduous trees; bark rough, ash-coloured or pale-to dark-brown, deeply longitudinally fissurred. Leaflets 7.5–40.2×3.5–36 cm, coriaceous, almost glabrous, obovate, ovate-

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rhomboid or elliptic-oblong. Racemes compact, on leafless branches. Pods 6–18×2.5–5.5 cm, sandy-brown, oblong, one-seeded, densely hairy. Seeds dark-brown, polished, elliptic-oblong, rounded on edges.

Throughout; common. (KHAKHRO, KESUDO, PALAS)

FLS & FRS : Dec.–May.

Butea parviflora Roxb. Hort. Beng. 53. 1814 (nomen) & Fl. Ind. 3:248. 1832; S 65. *Spatholobus parviflorus* (Roxb.) O. Ktze. Rev. Gen. Pl. 1:205. 1891. *Spatholobus roxburghii* Bth. Pl. Jungh. 3:238. 1851–55; FBI 2:193; C 1:394.

An extensive woody twiner. Leaflets 3.5–21.2×2.8–14.5 cm, obovate-rhomboid or broadly elliptic, subcoriaceous, appressed-pubescent. Flowers rose-coloured, in 10–35 cm long, terminal and axillary, compact racemes or panicles. Pods 7–12×1.2–3.5 cm, brown, oblong, rufous-pubescent.

Rajpipla and Dangs; not common. (PALASVEL)

FLS & FRS : Oct.–Feb.

Butea superba Roxb. Pl. Cor. 1:23. t. 22. 1795 & Fl. Ind. 3:247. 1832; FBI 2:195; C 1:396; S & J 17; S 66.

A large, woody twiner. Leaflets 4–28.5×3.6–18 cm, coriaceous, glabrescent, ovate-rhomboid or elliptic-oblong. Flowers orange-red, in 8–28 cm long, terminal and axillary, compact racemes or panicles. Pods 16.2×5.5 cm oblong, pale-brown or straw-coloured, hairy, reticulately veined.

Dangs and Saurashtra; rare. (KHAKHAR-VELO)

FLS & FRS : Feb.–Dec.

CAJANUS DC. nom. cons.

Cajanus cajan (L.) Millsp. in Field. Columb. Mus. Bot. 2:53. 1900; WI 2:6. ff. 6–8; Bailey 549; S & J 17; S 76. *Cytisus cajan* L. Sp. Pl. 739. 1753. *Cajanus indicus* Spreng. Syst. 3:248. 1826; FBI 2:217; C 1:435.

1.5–3 m tall shrubs. Leaflets 1.2–7.6×0.3–2.2 cm, elliptic-oblong or oblong-lanceolate, softly pubescent. Racemes few-flowered, condensed, axillary. Pods 2–4.5 cm long, 3–5-seeded, torulose, linear-lanceolate, pubescent. Seeds smooth, globose.

Throughout, cultivated; seldom an escape. (TUVER)

FLS & FRS : Sep.–Apr.

CANAVALIA DC. nom. cons.

Key to species

1. Plants usually twining, rarely creeping; seeds dull-red, chocolate-brown or amber-coloured; hilum nearly as long as seed :
   2. Seeds more than 1.4 cm long :
      3. Pods 15–30×2.5–4 cm, 8–12-seeded .. .. *C. gladiata*
      3. Pods 8–15×1.5–2 cm, 4–6-seeded .. .. .. *C. virosa*
   2. Seeds upto 1 cm long; racemes few-flowered .. *C. maritima*
1. Plants erect or semierect; seeds white; hilum half as long as seed .. .. *C. ensiformis*

Canavalia ensiformis (L.) DC. Prodr. 2:404. 1825; FBI 1:195; Bailey 577; Chatterjee in Journ. Indian bot. Soc. 28:84 t. (col.) C. 1949; S & J 17. *Dolichos ensiformis* L. Sp. Pl. 725. 1753.

Herbs. Leaflets 4–13.7×2.4–12 cm, ovate, glabrescent. Flowers 1.2–1.8 cm long, in compact racemes at ends of axillary peduncle. Pods 8.5–20×2–4 cm, straight, flat, glabrescent. Seeds ellipsoid, compressed, glabrous, smooth.

Reported by Santapau (1962) from Saurashtra-Rajkot; rare. (TARVARDI)

FLS & FRS : Aug.–Oct.

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Canavalia gladiata (Jacq.) DC. Prodr. 2:404. 1825; Chatterjee 86; Bailey 577; WI 2:55. ff. 27–29 (right-hand half); Ch & O 90; S & J 17; S 67. *Dolichos gladiatus* Jacq. Coll. Bot. 2:276. 1788. *Canavalia ensiformis* auct. non DC. 1825, nec *D. ensiformis* L. 1753; FBI 2:195; C 1:397.

A stout, glabrous, lignose twiner. Leaflets 3–13.5 × 1.7–11.5 cm, subcoriaceous, glabrous or nearly so. Racemes, compact at ends of stout, axillary peduncle. Pods glabrous, straight or slightly falcate. Seeds ellipsoidal, compressed, smooth, glabrous.

Throughout on hedges; common. (ABBO, ALAD, TARV-ARDI, FOFAL)

FLS & FRS : Aug.–Jan.

Canavalia maritima (Aubl.) Thouars. in Journ. Bot. Desv. 1:80. 1813; Chatterjee 87. t. D; S & J 17. *Dolichos maritimus* Aubl. Pl. Gui. 2:765. 1775. *Dolichos lineatus* Thunb. Fl. Jap. 280. 1784. *Canavalia lineata* DC. Prodr. 2:404. 1825; C 1:398. *Canavalia obtusifolia* auct. non DC. 1825; FBI 2:196; Thaker J. I. Fl. Barda Mountains 245. 1910.

Perennial, glabrous herbs. Leaflets 3–7 × 2.2–4.5 cm, coriaceous, ovate-orbicular or obovate, glabrescent above, pubescent, particularly on veins beneath. Flowers 1.5–2 cm long, in few-flowered, axillary and terminal racemes, at ends of long peduncles. Pods 8–15 cm long, linear-oblong, reddish-brown, appressed-pubescent. Seeds 4–9, ovoid or subglobose, glabrous, smooth.

Saurashtra and Kutch

FLS : April onwards

Canavalia virosa W. & A. Prodr. 253. 1834; Chatterjee 93. t. A; S & J 17. *Canvalia ensiformis* (L.) DC. var. *virosa* (W. & A.) Baker in Hk. f. FBI 2:196. 1876; C 1:398.

An extensive, glabrous, twiner. Leaflets 3.2–14 × 1.3–9 cm, broadly ovate or nearly orbicular, appressed-pubescent. Flowers

2.5–3.5 cm long, few, in terminal and axillary racemes. Pods linear-oblong, flat, sparsely hairy. Seeds oblong, glabrous, smooth.

Saurashtra (Girnar); fairly common on lower slopes. (SEM)

FLS & FRS : Oct.

CICER L.

Cicer arietinum L. Sp. Pl. 738. 1753; FBI 2:176; C 1:435; Bailey 554; WI 2:154. ff. 68 & 70; S & J 17.

Diffuse herbs. Leaves 2–5.8 cm long; leaflets 9–19, 0.4–1.2 × 0.2–0.4 cm, ovate-oblong or obovate, glandular-pubescent, serrate, subsessile. Flowers violet-purple, axillary, solitary. Pods 1.3–2 cm long, turgid, 1–2-seeded, glandular-pubescent. Seeds smooth, brown, obtusely subquadrate, pointed at one end.

Cultivated; also an escape. (CHANA)

FLS & FRS : Oct.–Mar.

CLITORIA L.

Key to species

1. Annuals, erect; leaflets 3–5; Flowers geminate, rarely solitary by abortion; pods 2.5–5 × 0.4–1.2 cm; seeds 4–6.. ..*C. biflora*
1. Perennials, twining or scandent; leaflets 5–9; flowers usually solitary; pods 6–10 × 1–1.5 cm; seeds 6–10 .. ..*C. ternatea*

Clitoria biflora Dalz. in Kew Journ. Bot. 2:35. 1850; FBI 2:208; C 1:406; Ch & O 80; S & J 17.

An erect herb, 30–75 cm tall. Leaves alternate, imparipinnate; leaflets 5–9.2 × 1–1.7 cm, ovate-oblong or elliptic, sparingly hairy or nearly glabrous, entire. Flowers blue, deflexed. Pods linear, flat, thinly hairy, mucronate. Seeds blackish-brown, glabrous, smooth.

Throughout in undergrowth of forests and in shaded spots along roads or edges of cultivated fields; occasional.

FLS & FRS : July–Jan.

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Clitoria ternatea L. Sp. Pl. 753. 1753; FBI 2:208; C 1:405; Bailey 571; WI 2:233; Ch & O 80; S & J 17.

Slender, rambling twiners. Leaves 3–5 cm long, alternate; leaflets (5–)7–9, 1–4.8×0.7–3.5 cm, elliptic-oblong, ovate-oblong or obovate, glabrescent. Flowers blue or white. Pods linear-oblong, flat, appressed-hairy, slightly falcate. Seeds oblong, compressed, yellowish-brown, mottled black, smooth, glabrous.

Throughout on hedges; common. (GARNI, GOKARN, KOYAL, BIBLI)

FLS & FRS : Throughout the year.

CROTALARIA L.

Key to species and varieties

1. Leaves compound :
   2. Pods 2-seeded, hairy or velvety :
      3. Calyx-teeth exceeding the tube; pods subglobose.. .. ..*C. medicaginea*
      3. Calyx-teeth equalling the tube; pods subquadrangular .. ..*C. notonii*
   2. Pods 8–10 or more-seeded, glabrous.. .. ..*C. orixensis*
1. Leaves simple :
   4. Pods glabrous :
      5. Corolla exserted or longer than calyx :
         6. Diffuse annuals; racemes few-flowered :
            7. Stem filiform, hairy; pods 0.3–0.6 cm long.. .. ..*filipes* var. *filipes*
            7. Stem stout, densely hairy; pods 0.8–1 cm long .. ..*C. filipes* var. *trichophora*
         6. Erect herbs, undershrubs or shrubs; racemes many-flowered, compact or lax :

            8. Stipules present:
               9. Stipules and bracts large, leafy..*C. spectabilis*
               9. Stipules and bracts not as above..*C. retusa*
            8. Stipules absent.. .. .. ..*C. linifolia*
      5. Corolla not exserted:
         10. Erect or diffuse plants; racemes terminal or a few also lateral :
            11. Stipules absent :
               12. Racemes capitate :
                  13. Upper teeth of calyx connate; hairs on plants not brown.. .. ..*C. nana*
                  13. Upper teeth of calyx long, lanceolate; hairs on plants brown.. .. ..*C. chinensis*
               12. Racemes lax.. .. ..*C. albida*
            11. Stipules present :
               14. Pods exserted.. .. .. ..*C. mysorensis*
               14. Pods included or scarcely exserted.. .. ..*C. calycina*
         10. Prostrate; racemes few-flowered, all lateral:
            15. Bracts minute, subulate.. ..*C. prostrata*
            15. Bracts leafy, lanceolate.. ..*C. vestita*
      4. Pods hairy :
         16. Corolla bluish-purple.. .. .. ..*C. verrucosa*
         16. Corolla yellow :
            17. Plants bushy undershrubs.. .. ..*C. burhia*
            17. Plants usually erect, 0.75–2.5 m tall :
               18. Leaves obtuse or subacute; stem terete; pod 10- or more-seeded.. .. ..*C. juncea*
               18. Leaves acute to acuminate; stem sharply quadrangular; pod 4–6-seeded.. ..*C. leptostachya*

Scanned by CamScanner

16. Plants diffuse, if erect not more than 45 cm tall :

18. Stipules absent.. .. ..*C. pusilla*

18. Stipules present :

19. Branches triquetrous.. .. ..*C. triquetra*

19. Branches not as above :

20. Corolla more than 1 cm long :

22. Corolla pure yellow.. ..*C. hirsuta*

22. Corolla yellow with purple wings.. .. ..*C. bifaria*

20. Corolla less than 1 cm long ..*C. evolvuloides*

Crotalaria albida Heyne ex Roth, Nov. Pl. Sp. 333. 1821; FBI 2:71; C 1:315; Ch & O 83; S 53.

Prostrate or suberect herbs, 15–45 cm tall, woody at base. Leaves 0.5–4.5×0.3–1.3 cm, linear-oblong or obovate, appressed-hairy, pellucido-punctate, subsessile. Flowers yellow, few, distant, in 5–20 cm long racemes. Pods 1–1.2×0.3–0.5 cm, oblong-cylindric, glabrous. Seeds compressed, brownish-black, shining, glabrous, smooth, subreniform.

South and Central Gujarat, occasional among grasses and in cultivated fields.

FLS & FRS Sep.–Feb.

Crotalaria bifaria L. f. Suppl. 322. 1781; FBI 2:69; C 1:313; Ch & O 84; S & J 17.

An erect or suberect herb, hairy, about 30 cm tall. Leaves 3–6.4×1.2–3.2 cm, broadly ovate, hairy, rounded at base. Flowers yellow with purple wings, in lateral racemes. Pods 1.5–2.8 cm long, oblong. Seeds brown, subreniform, compressed, smooth, glabrous.

Saurashtra, Baroda and Pavagadh; not common. (FATAKIYA)

Crotalaria burhia Buch.-Ham. in Wall. Cat. 5836. 1831–32 (nomen) ex Bth. in Hk. Lond. Journ. Bot. 2:474. 1843; FBI 2:66; C 1:311; Ch & O 84; S & J 17.

0.3–1.2 m tall, bushy, appressed-pubescent undershrubs. Leaves 0.5–1.5×0.3–0.7 cm, elliptic-oblong or lanceolate, appressed-silky-pubescent, sessile. Flowers yellow, in 5–24 cm long, terminal racemes. Pods 0.4–0.8 cm long, appressed-pubescent to almost villous. Seeds subreniform, dark-brown, compressed, shining, smooth, glabrous.

Throughout in semi-arid and arid regions; common, scattered or subgregarious; rare in deciduous forest clearings. (KHARSHAN, VAGDAUSHAN)

FLS & FRS : Nearly throught the year.

Crotalaria calycina Schrank. Pl. Rar. Monac. t. 12 1819; FBI 2:72; C 1:317.

30–60 cm tall, densely appressed-silky-pubescent herbs. Leaves 2.4–7.5×0.3–1.4 cm, subsessile, narrowly linear to linear-lanceolate, appressed-silky-pubescent beneath. Flowers 2–2.6 cm long, 2–12, in terminal racemes. Pods 1.6–2.2 cm long, sessile, dark-brown. Seeds many, yellowish-brown, subreniform, smooth, glabrous.

Bulsar and Dangs; rare.

FLS & FRS : Nov.

Crotalaria chinensis Linn. Syst. (ed. 10) 1158. 1759; FBI 2:73; C 1:316.

30–60 cm tall, patently silky-brown-hairy herbs. Leaves 2–4.5×0.3–0.6 cm, subsessile, oblong-lanceolate, silky-brown-hairy. Flowers yellow, in terminal, capitate racemes. Pods 0.9–1 cm long, sessile, oblong or nearly globose.

Dangs; occasional.

FLS & FRS : Oct.

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Crotalaria evolvuloides Wt. ex W. & A. Prodr. 1:188. 1834. FBI 2:68; S & J 17.

Listed by Thaker J. I. (p. 178. 1910 & p. 77. 1926) from Saurashtra and Kutch, and on that authority it is included by Santapau (1962). (VELARA-FATAKIYO)

Crotalria filipes Bth. var. filipes. *Crotalaria filipes* Bth. in Hk. Lond. Journ. Bot. 2:475. 1843; FBI 2:66; C 1:312; S & J 17.

Prostrate, patently hairy herbs. Leaves 0.3–1.5 × 0.2–0.6 cm, subsessile, ovate to ovate-oblong, minutely pellucido-punctate, hairy. Flowers small, yellow, distant, in leaf-opposed racemes. Pods 0.5–0.7 cm long.

Bulsar, Dangs, Saurashtra and Kutch, among grasses; not frequent. (MAKHMALI ADADIO)

FLS & FRS : Oct.–Dec.

Crotalaria filipes Bth. var. **trichophora** (Bth. ex Baker) Cooke, Fl. Pres. Bombay 1:293. 1902 & 1:312. 1958 (reprinted); S & J 17; S 52. *Crotalaria trichophora* Bth. MSS. ex Baker in Hk. f. FBI 2:67. 1876.

Densely hairy, stout, prostrate herbs. Leaves 1.2–2.5 × 0.7–0.8 cm, ovate-oblong, pubescent. Flowers yellow, in 1–2.5 cm long, lateral racemes. Pods oblong, glabrous.

Bulsar and Saurashtra; rare among grasses.

FLS & FRS : Oct.

Crotalaria hirsuta Willd. Sp. Pl. 3:978. 1802; FBI 2:68; Thaker J. I. Fl. Barda Mountains 178. 1910 & Fl. Kutch 77. 1926.

20–45 cm tall, silky-hairy herbs. Leaves 1.2–4.5 × 0.4–2.5 cm, subsessile, ovate, appressed-hairy. Flowers yellow, 2–3, in 1–1.5 cm long, lateral racemes. Pods 1–1.4 cm long, oblong, finely downy. Seeds 8–10, subreniform, dark-brown or blackish-brown, shining, smooth.

Kutch, Saurashtra, Rajpipla and Chhotaudepur; not common.

FLS & FRS : Nov.–May

Crotalaria juncea L. Sp. Pl. 714. 1753; FBI 2:79; C 1:320; WI 2:273. f. 136; Ch & O 84; S & J 17.

An erect, rigid, 0.4–2 m tall, silky-pubescent undershrub. Leaves 3.2–17 × 0.6–4 cm, linear-lanceolate or elliptic-lanceolate, subsessile, appressed-pubescent. Flowers 1.5–2 cm long, bright-yellow, in terminal and lateral, 10–15 cm long, erect, lax racemes. Pods 2.5–4.7 cm long, obovate-oblong. Seeds subreniform, compressed, brown or yellowish-brown, smooth, glabrous.

Throughout, under cultivation; sometimes an escape. (SHUN, SHAN; SHANIYU)

FLS & FRS : Nov.–Jan.

Crotalaria leptostachya Bth. in Hk. Lond. Journ. Bot. 2:562. 1843; FBI 2:78; C 1:320; S & J 17.

An erect, rigid, fulvous-pubescent undershrub. Leaves 5.6–14.5 × 1.2–4.3 cm, oblong-lanceolate or linear-oblong, appressed-silky-pubescent, membranous, subsessile. Flowers yellow, in 20–35 cm long, terminal and axillary racemes. Pods 1.5–2 cm long. Seeds yellowish-brown, subreniform, compressed, smooth, glabrous.

Dangs, Vyara, Vansda and Rajpipla forest ranges in South Gujarat; occasional (but rare at Rajpipla). (JANGLI-SAN)

FLS : Aug.–Oct. *FRS* : Sept.–Nov.

Crotalaria linifolia L. f. Suppl. 322. 1781; FBI 2:72; C 1:317; Ch & O 83; S & J 17.

Erect, suffruticose, 35–100 cm tall, appressedly silky-hairy undershrubs. Leaves 1–4.5 × 0.4–0.6 cm, alternate, obovate-oblong, sessile or subsessile, appressed-hairy beneath. Flowers yellow, in 10–25 cm long, simple or branched, terminal, lax racemes. Pods 0.4–0.8 cm long, ovoid-oblong, smooth, minutely apiculate, deflexed. Seeds pale-brown, smooth, glabrous, reniform.

Throughout, among grasses and forest undergrowth; rarely on sandy river beds; not common. (ADABAU-SAN)

FLS & FRS : Aug.–Jan.

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Crotalaria medicaginea Lam. Encycl. Meth. Bot. 2:201. 1786; FBI 2:81; C 1:322; WI 2:382; Ch & O 84; S & J 17.

80-80 cm tall, thinly appressed-hairy, erect herbs. Leaflets 3, 0.9-3.5×0.4-1.5 cm, subsessile, oblanceolate or obovate-oblong, appressed-pubescent beneath. Flowers yellow, in 3-10 cm long, terminal or leaf-opposed racemes. Pods 0.3-0.5 cm long, obliquely minutely beaked, subglobose. Seeds compressed, smooth, glabrous, dark-brown, subreniform.

Throughout, common and abundant, often in pure stands everywhere. (ADBAU METHI, RANMETHI)

FLS & FRS : Aug.-Feb.

Crotalaria mysorensis Roth, Nov. Pl. Sp. 338. 1821; FBI 2:70; C 1:314; Ch & O 82.

Erect, somewhat woody at base, 30-75 cm tall, silky-brown-hairy herbs. Leaves 4.5-12.2×0.4-1.7 cm, sessile, linear-oblong, pilose. Flowers 1.4-1.8 cm long, yellow, in 5-7 cm long, terminal, lax racemes. Pods 2-3 cm long, oblong, shortly beaked. Seeds yellowish-brown, spherical or subreniform, smooth, glabrous.

Throughout (except Kutch); in forest undergrowth, open grasslands and cultivated fields; not common.

FLS & FRS : Aug.-Jan.

Crotalaria nana Burm. f. Fl. Ind. 156. t. 48. f. 2. 1768; FBI 2:71; C 1:315.

Erect herbs, 30-45 cm tall, silky-brown-hairy Leaves 1.3-4×0.3-0.9 cm, oblong or oblanceolate, pellucido-punctate, appressed-silky-hairy. Flowers yellow, in capitate, terminal racemes. Pods 0.4-0.6 cm long, globose-ovoid. Seeds 6-10, reniform, dark-brown, compressed, glabrous.

Bulsar, Dangs and Vyara; rare.

FLS & FRS : Sep.-Oct.

Crotalaria notonii W. & A. Prodr. 192. 1834; FBI 2:82; C 1:323; S & J 17.

Erect, silky-hairy undershrubs. Leaflets 3,0.4-1.5×0.2-0.5 cm, obovate-cuneate, appressed-hairy. Flowers yellow, in terminal or leaf-opposed racemes. Pods 0.5-0.6 cm long, subquadrangular. Seeds subreniform, deep-brown or blackish-brown, glabrous, smooth.

Surat (Domas), Rajpipla, Saurashtra and Kutch, in cultivated fields and at Domas on sandy sea shore; rare.

FLS & FRS : Oct.-Dec.

Crotalaria orixensis Willd. in Ges. Naturf. Fr. Neue Schr. 4:217. 1803; FBI 2:83; C 1:323; S & J 17.

Prostrate or suberect herbs, somewhat woody at base. Leaflets 3,0.9-3.5×0.3-2.5 cm, obovate-oblong, appressed-hairy beneath. Flowers yellow, in 3-6 cm long, terminal and axillary racemes. Pods 0.7-1.2 cm long, cylindric, glabrous. Seeds 8-10, elliptic or subreniform, greenish-yellow, sometimes mottled black, glabrous, smooth.

Throughout (except Kutch) in plains among grasses, in waste places along road sides and railway lines, seldom in forest undergrowth; occasional. (TRIPANI-FATAKIYA)

FLS & FRS : Sep.-Dec.

Crotalaria prostrata Rottl. in Willd. Enum. Hort. Berol. 1809; FBI 2:67; C 1:312; S & J 17.

Prostrate or diffuse, silky-pubescent, slender herbs. Leaves 1.2-9.5×0.4-0.9 cm, subsessile, oblong or oblong-obovate, silky-pubescent, pellucido-punctate. Flowers yellow, 2-4, in lateral racemes. Pods 1.5-1.8 cm long, oblong. Seeds 12-15, glabrous, smooth, subreniform, polished, brown.

Saurashtra, Devgadh-Baria and Dangs; very rare.

FLS & FRS : Oct.-Dec.

Scanned by CamScanner

Crotalaria pusilla Heyne ex Roth, Nov. Pl. Sp. 335. 1821; W. & A. Prodr. 189. 1834; FBI 2:70; C 1:315.

8–10 cm tall, appressed-silky-hairy herbs. Leaves 0.6–2.8 × 0.2–0.3 cm, subsessile, linear-oblong, densely appressed-silky-hairy. Flowers yellow, 3-10, in lateral racemes. Pods 0.5–0.8 cm long, oblong. Seeds 4–8, brown, subreniform, glabrous.

Chhotaudepur, North Gujarat (Bavsar); rare.

FLS & FRS : Sep.–Oct.

Crotalaria retusa L. Sp. Pl. 715. 1753; FBI 2:75; C 1:318; Ch & O 83; S & J 17.

Erect, appressed-hairy, 20–120 cm tall undershrubs. Leaves 2.2–8 × 1–3 cm, obovate-oblong or oblanceolate-oblong, pubescent beneath, subsessile. Flowers bright-yellow, in 5–18 cm long, compact, terminal racemes. Pods 3–3.8 cm long, obovate-oblong, deep-purple to almost black. Seeds subreniform, dark-brown, glabrous, smooth, polished.

Throughout, in forest undergrowth, under hedges along roads and in cultivated fields; common. (GUGHRO)

FLS & FRS : July-April

Crotalaria spectabilis Roth, Nov. Pl. Sp. 341. 1821; Ali in Biol. 12(2):26. 1966. *Crotalaria sericea* Retz. Obs. Bot. 5:26. 1789; FBI 2:75; C 1:319.

1–1.5 m tall, glabrous undershrubs. Leaves 4–15 × 1–7 cm, obovate-oblong or oblong-lanceolate, appressed-hairy beneath, subsessile. Flowers bright-yellow, in 3.5–22 cm long, terminal and axillary racemes. Pods 4–6 cm long, obovate-oblong. Seeds dark-brown or black, reniform, glabrous, faintly reticulate.

Dangs and Rajpipla; rare.

FLS & FRS : Sep.–Jan.

Crotalaria triquetra Dalz. in Hk. Kew Journ. Bot. 2:34. 1850; FBI 2:71; C 1:314; Ch & O 83; S & J 18; S 53.

Slender, prostrate, suberect or diffuse, often radially spreading herbs. Leaves 0.6–6.2 × 0.4–1.3 cm, sessile, elliptic-oblong or ovate-oblong, sparsely hairy beneath. Flowers yellow, in 3–6 2 cm long, terminal and lateral, lax racemes. Pods 1.3–2 cm long, oblong-cylindric. Seeds subreniform or nearly spherical, smooth, glabrous, dark-brown.

Throughout (except Kutch) among grasses in the forest undergrowth and as a weed in cultivated fields; not common.

FLS & FRS : Aug.–April

Crotalaria verrucosa L. Sp. Pl. 715. 1753; FBI 2:77; C 1:319.

25–90 cm tall, erect herbs. Leaves 2–11.5 × 1.2–7.2 cm, ovate-rhomboid, pubescent beneath. Flowers bluish-purple, in 8–15 cm long, axillary and terminal racemes. Pods 2.3–4 cm long, oblong-cylindric. Seeds subreniform, yellowish-brown, polished, smooth, glabrous.

Reported by Dr. Bedi from Central Gujarat (Ratanmahals).

FLS & FRS : July–Oct.

Crotalaria vestita Baker in Hk. f. FBI 2:67. 1876; C 1:313; S & J 18; S 52.

Erect, 30–45 cm tall, patently, long silky-hairy herbs. Leaves 0.8–7 × 0.3–2.2 cm, oblong or obovate-oblong, appressed-hairy, subsessile. Flowers yellow, few, in 2.5–15 cm long, densely silky-hairy racemes. Pods 0.6–1.8 cm long, oblong. Seeds greenish or yellowish-brown, subreniform, smooth, glabrous.

Bulsar, Dangs, North Gujarat (Shamlaji) and Saurashtra; common at Dangs in the forest undergrowth and open grass-fields, rare at Shamalaji.

FLS & FRS : Oct.–Dec.

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CYAMOPSIS DC.

Cyamopsis tetragnoloba (L.) Taub. in Pflam. 3(3):259. 1894; WI 2:407. f 149; S & J 18. *Psoralea tetragonoloba* L. Mant. 104. 1767. *Cyamopsis psoralioides* DC. Prodr. 2:216. 1825; FBI 2:92; C 1:328.

Erect, annual, appressed-hairy herbs, 0.5–1 m tall. Leaves 3-foliolate, petiolate; leaflets 1.3–10 × 1–7.5 cm, broadly ovate to ovate-elliptic, rarely elliptic-lanceolate, appressed-hairy. Flowers pale-rosy-purple or light-violet, in condensed, short, axillary racemes. Pods 3–9 × 0.3–0.6 cm, linear, long beaked, nearly glabrous or coarsely hairy. Seeds subtetragonous, greyish-black, microscopically tuberculate.

Cultivated; frequently as an escape. (GAWAR, GUWAR)

FLS & FRS : Throughout the year.

CYLISTA Ait.

Cylista scariosa Roxb. Pl. Cor. 1:64. t. 22. 1795; FBI 2:219; C 1:412.

An extensive, woody, grey-pubescent twiner. Leaves 3-foliolate; leaflets 1–11.2 × 0.4–6 cm, ovate, ovate-rhomboid or elliptic-ovate, coriaceous, fulvous-pubescent beneath. Flowers yellow, in 3.2–15 cm long, compact, terminal and axillary racemes. Pods 0.8–1 cm long, pubescent, enclosed in persistent calyx. Seeds black, reniform, glabrous, smooth.

Rajpipla, Dangs, Bulsar and Sanjan (Vadali); frequent on hedges and low forest trees.

FLS & FRS : Dec.–Mar.

DALBERGIA L. f. nom. cons.

Key to the species

1. Trees :
   2. Stamens monadelphous, usually 9; staminal tube split along upper side only :

43400

   3. Leaflets 3–5, acuminate; flowers distinctly stalked .. .. *D. sissoo*
   3. Leaflets 5–7, subacute, obtuse or emarginate; flowers nearly sessile .. .. *D. latifolia*
   2. Stamens diadelphous, 5+5; staminal tube split on the upper and lower sides so that filaments are in two distinct bundles :
      4. Leaflets with prominent parallel nerves; standard with a callosity at base of limb .. .. .. *D. lanceolaria*
      4. Leaflets with reticulate venation; standard without a callosity at base of limb .. .. .. *D. paniculata*
1. Climbing shrubs :
   5. Ultimate branches hooked; stamens 5+5; stem and branches unarmed, usually dark-purple .. .. .. *D. volubilis*
   5. Ultimate branches not hooked; stamens 10, in one bundle; stem and branches armed .. .. *D. sympathetica*

Dalbergia lanceolaria L. f. Suppl. 316. 1781; FBI 2:235; C 1: 425; WI 3:3. f. 2; Bor 89; Ch & O 87; S & J 18; S 75.

5–10 m tall trees, with straight trunk and pale-greyish-white, smooth bark. Leaves 15–25 cm long, alternate; leaflets 1.5–7 × 1.2–4.2 cm, elliptic-oblong, glabrous above, puberulus beneath. Flowers 0.7–0.9 cm long, in axillary and terminal, leafless panicles. Pods 3–6 cm long, strap-shape, glabrous or nearly so

In deciduous forests; rare. (TANTOSHI)

FLS : Nov.–Mar. *FRS* : upto June

Dalbergia latifolia Roxb. Pl. Cor. 2:7. t. 133. 1798; FBI 2:231; C 1:422; WI 3:4. Pl. 2. (col.) & ff. 3, 4, 6 & 7; Bor 89; Ch & O 86; S & J 18; S 74.

8–10 m tall trees, with grey or ash-coloured, smooth bark. Leaves 8–20 cm long, alternate; leaflets 0.8–8.2 × 0.6–7.4 cm, broadly ovate to orbicular or suborbicular, rarely obovate, glabrous.

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Flowers creamy-white, in 4-13 cm long, axillary or extra-axillary, lax panicles. Pods 2.5-4.5×0.8-2.5 cm, 1-2-seeded, lanceolate or strap-shaped, glabrous, reticulate.

In deciduous forest in hilly regions; rather common. (SISAM)

FLS : Mar.-Aug. *FRS* : May-Nov.

Dalbergia paniculata Roxb. Pl. Cor. 2:8. t. 114. 1789; FBI 2: 236; C 1:426; WI 3:123; Bor 99; S & J 18.

Trees, 10-15 m tall, with straight trunk and smooth, grey bark. Leaves 8-15 cm long, alternate; leaflets 10-15, 1-4.5×0.8-3 cm, oblong-obovate, elliptic or obovate-oblong, entire, subcoriaceous, glabrous at length. Flowers creamy-white or pale-yellow, often with a touch of pink, in terminal, paniculate cymes. Pods 3.4-9.2×1-1.7 cm, lanceolate, glabrous, acute at ends. Seeds reniform, smooth, dark-brown.

In deciduous forests; not common. (PATARAL, PATARALI, PATHAD, PATRADO)

FLS : Mar.-May *FRS* : May-Oct.

Dalbergia sissoo Roxb. Hort. Beng. 53. 1814 (nomen) & Fl. Ind. 3:223. 1832; FBI 2:231; C 1:421; Bor 88.

7-10 m tall trees, with thick, greyish-black or light-brown, longitudinally furrowed bark. Leaves 6-15 cm long; leaflets distantly alternate, 1-7.2×0.6-6.4 cm, broadly ovate or nearly orbicular, subcoriaceous, puberulous. Pods 3.6-6×0.9-1.2 cm, lanceolate, glabrous, reticulate. Seeds brownish, subreniform, glabrous.

Planted; seldom in forests. (MOTOSISAM)

FLS & FRS : Jan.-Oct.

Dalbergia sympathetica Nimmo ex Grah. Cat. Bombay Pl. 55. 1839; FBI 2:234; C 1:424; S 75.

An extensive, scandent, spinous shrub. Leaves 10-15 cm long; leaflets 1.2-3×0.5-2 cm, oblong, softly pubescent. Flowers in axillary, dense panicles. Pods 4-6×1.2-1.6 cm, 1(-2)-seeded, lanceolate.

Listed from Ratanmahals, Devgadhbaria forest Division in Panchmahals by Dr. Bedi (1969).

Dalbergia volubilis Roxb. Pl. Cor. 2:48. t. 191. 1798; FBI 2:235; C 1:426.

A large, woody climber. Leaves 8-16 cm long, alternate, imparipinnate; leaflets 9-17, 0.7-5.3×0.5-2.7 cm, alternate, subsessile, oblong to obovate-oblong, glabrous. Flowers light-purple or bright-pink, in axillary and terminal, 15-32 cm long panicles. Pods 3.4-8.5×1.1-2.4 cm, lanceolate, prominently reticulately veined, acute at ends.

In deciduous forests (Bulsar, Dangs, Vyra, Rajpipla); not common. (NILSOTI)

FLS & FRS Jan.-Apr.

DERRIS Lour. nom. cons.

Key to species

1. Trees; pods not winged.. .. ..*D. indica*

1. Climbers; pods winged.. .. ..*D. scandens*

Derris indica (Lam.) Bennet in Journ. Bombay nat. Hist. Soc. 68:303. 1971. *Galedupa indica* Lam. Encycl. 2:594. 1788-89. *Cytisus pinnatus* L. Sp. Pl. 1:741. 1753 (non *Derris pinnata* Lour.). *Pogamia glabra* Vent. Jard. Malm. 28. 1803; FBI 2:240; C 1:429. *Pogamia pinnata* (L.) Pierre, Fl. For. Cochinch. sub. t. 385. 1899; Ch & O 87; S & J 19; S 75.

Evergreen trees, 7-15 m tall, with greyish-white or light black, rough bark. Leaves 15-40 cm long, alternate, imparipinnate; leaflets 5-9, 3.5-12.6×1.8-8.5 cm, coriaceous, broadly ovate or

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elliptic, glabrous, entire. Flowers 1–1.2 cm long, white with purple tinge, in 6–25 cm long, axillary, drooping racemes. Pods 3–6.5×1.2–3.5 cm, elliptic-oblong, thick, compressed, glabrous, smooth. Seeds oblong or slightly reniform, brown, rugose.

Throughout, wild, mostly along river banks; also planted. (KARANJ)

FLS & FRS : Feb.–July

Derris scandens (Roxb.) Bth. in Journ. Linn. Soc. 4 (Suppl.): 103. 1869; FBI 2:240; C 1:430. *Dalbergia scandens* Roxb. Pl. Cor. 2:t. 192. 1798.

A large, woody climber, with smooth, dark-brownish-purple, lenticellate bark. Leaves 3–10 cm long; leaflets 7–9, 2.5–8×1–4 cm, subsessile, coriaceous, obovate or elliptic-oblong. Flowers white, in 8–30 cm long, axillary, pendulous racemes. Pods 2.8–3.5×0.8–1.2 cm, lanceolate, flat.

Dangs (Unai, occasional) and Bulsar (rare).

FLS : June–Aug. *FRS* : July–Oct.

DESMODIUM Desv. nom. cons.

Key to species and varieties

1. Leaves trifoliolate :
   2. Flowers white, or tinged pink, in axillary umbels; branches triquetrous; pods woody .. .. *D. triangulare* var. *congesta*
   2. Flowers bright purple, seldom white, usually in elongated racemes, if flowers 1–3 in axillary fascicles, plants prostrate :
      3. Shrubs or undershrubs :
         4. Pods deeply constricted between seeds; joints dehiscent .. .. *D. heterocarpon*
         4. Pods scarcely constricted between seeds; joints indehiscent.. .. .. *D. laxiflorum*
      3. Herbs (rarely also undershrubs as in .. *D. repandum*):
         5. Pods twisted .. .. *D. neomexicanum*

5. Pods not as above :
   6. Stipules foliaceous, auriculate .... *D. dichotomum*
   6. Stipules not foliaceous :
      7. Plants prostrate, not viscidly hairy; flowers 1–3, in axillary fascicles .. .. *D. triflorum*
      7. Plants erect, viscidly hairy, flowers in racemes .. .. *D. repandum*

1. Leaves unifoliolate:
   8. Shrubs or undershrubs :
      9. Petiole winged .. .. *D. triquetrum*
      9. Petioles not winged :
         10. Branches angled; joints of pods longer than broad; leaflets not fulvous-hairy :
            11. Leaflets 2.3–15.2×1–8.3 cm, ovate-oblong, lanceolate or ovate-lanceolate, rarely oblong, not blotched on upper surface, rounded or subcordate at base .. .. .. *D. gangeticum* var. *gangeticum*
            11. Leaflets 0.5–1.6×0.4–1.1 cm, nearly orbicular, blotched with pale-yellow spots, cordate at base .. .. *D. gangeticum* var. *maculatum*
         10. Branches terete; joints of pods as long as broad; leaflets fulvous-hairy .. .. .. *D. velutinum*
   8. Herbs :
      12. Leaflet reniform, glabrous on both surfaces; joints of pods not turgid ... . *D. renifolium*
      12. Leaflet orbicular, appressed-hairy beneath; joints of pods somewhat turgid .. .. .. *D. rotundifolium*

1. Leaves 1-foliolate and 3-foliolate mixed .. .. *D. alysicarpoides*

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Desmodium alysicarpoides Knnap van Meeuvan in Reinward. 6:246. 1962; S 63. *Alysicarpus parviflorus* Dalz. in Hk. Kew. Journ. Bot. 3:211. 1850. *Desmodium parviflorum* (Dalz.) Baker in Hk. f. FBI 2:172. 1876; C 1:381 (non Mart. 1843).

An erect, much-branched herb, fulvous-hairy. Leaflets 0.6–1.5×0.3–1.4 cm, appressed-hairy beneath. Racemes terminal and axillary, 2.3–10.2 cm long, lax. Pods 0.7–1.3 cm long, falcate, lower suture slightly indented, 3–5-jointed, glabrescent.

Only one specimen collected from the forest undergrowth at Vyara in South Gujarat.

FLS & FRS : Dec.

Desmodium dichotomum (Klein ex Willd.) DC. Prodr. 2:336. 1825; Knaap van Meeuvan in Reinward. 6:248. 1962. *Hedysarum diffusum* Willd. Sp. Pl. 3(2):1180. 1802. *Hedysarum dichotomum* Klein ex Willd. Sp. Pl. 3(2):1180. 1803. *Desmodium diffusum* (Willd.) DC. Prodr. 2:336. 1825 (nom. illegit., non DC. Prodr. 2:335. 1825 quest *D. laxiflorum* DC.); FBI 2:169; C 1:377; S & J 18.

30–100 cm tall, viscidly-pubescent herbs. Leaflets 1.4–19 ×0.8–4.9 cm, ovate-oblong, elliptic-oblong or obovate, hairy. Racemes lax, terminal and axillary, 2–15 cm long. Pods 1.2–2 cm long, linear, 3–6-jointed, covered with hooked hairs.

Common, throughout as a weed in cultivated fields, along road sides and railway lines and in forest undergrowth. (PAN-DARIYO SAMERVO).

FLS & FRS : July–Dec.

Desmodium gangeticum (L.) DC. var. **gangeticum**. *Desmodium gangeticum* (L.) DC. Prodr. 2:327. 1825; FBI 2:168; C 1:379; Ch & O 72; S & J 18; S 62. *Hedysarum gangeticum* L. Sp. Pl. 746. 1753.

90–120 cm tall undershrubs, grey-downy in younger parts. Racemes axillary and terminal, slender, 10–40 cm long. Pods 2.3–4.5 cm long, falcate, 4–6-jointed, compressed, clothed with hooked hairs.

Throughout in the undergrowth of forests and in shaded spots along road sides and railway lines; common.

FLS & FRS : Aug.–Nov.

Desmodium gangeticum (L.) DC. var. **maculatum** (L.) Baker in Hk. f. FBI 2:168. 1876; C 1:379; Ch & O 73; S & J 18. *Hedysarum maculatum* L. Sp. Pl. 746. 1753.

10–25 cm tall undershrubs, appressed-pubescent. Racemes 5.8–12 cm long, terminal and axillary. Pods 0.8–1.6 cm long, falcate, straight, clothed with minute, hooked hairs.

Rare, so far reported from Broach, Baroda, Pavagadh, Chhotaudepur and Saurashtra.

FLS & FRS : Dec.–Jan.

Desmodium heterocarpon (L.) DC. Prodr. 2:337. 1825; S 62. *Hedysarum heterocarpon* L. Sp. Pl. 747. 1753. *Hedysarum polycarpon* Poir. Encycl. 6:413. 1804. *Desmodium polycarpon* (Poir.) DC. Prodr. 2:334. 1835; FBI 2:171; C 1:377.

An erect or suberect, slender, appressed-pubescent undershrub. Leaflets 1.8–5.2×1–2.2 cm, obovate-oblong, sparsely appressed-hairy beneath. Racemes 2.4–7.2 cm long, terminal and axillary. Pods 1–1.6×0.3–0.4 cm, linear-oblong, densely pubescent, 5–8-jointed.

So far from Surat and Dangs; very rare.

FLS & FRS : Oct.

Desmodium laxiflorum DC. in Ann. Sci. Nat. 4:100. 1825 & Prodr 2:335. 1825; FBI 2:164; C 1:376; Ch & O 73; S & J 18; S 61.

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An erect, hairy undershrub, 40–90 cm tall. Leaflets 5.8–11.2×2.4–6.5 cm, ovate-elliptic or obovate, membranous, glabrous above, pubescent beneath, terminal leaflet largest. Racemes 15.2–18.5 cm long, axillary and terminal. Pods 0.5–0.8 cm long, falcate, linear, pubescent; hairs viscid, hooked.

Throughout (except Kutch), in the undergrowth of forests; occasional.

FLS & FRS : Aug.–Dec.

Desmodium neomexicanum A. Gray, Pl. Wright 1:53. 1852. Chavan, Sabnis & Bedi in Kew Bull. 17:265. 1963.

Erect or suberect, slender, hairy herbs, 30–90 cm tall. Leaflets 0.5–3×0.4–1.2 cm, terminal largest, all membranous, ovate or ovate-lanceolate, nearly glabrous but for ciliate margins. Racemes terminal and axillary, 8–15 cm long. Pods 0.5–2.3 cm long, 2–4-jointed; joints flat, hairy, ciliate on margins. Seeds 0.2–0.3 cm long, smooth, glabrous, pinkish-brown, grooved at one end.

Throughout, scattered in shaded spots or in undergrowth of forests; occasional.

FLS & FRS : Oct.–Dec.

Desmodium renifolium (L.) Schindl. in Fedde, Rep. 22:262. 1926; S & J 18; S 63. *Hedysarum renifolium* L. Syst. Nat. (ed.10) 2:1169. 1759. *Hedysarum reniforme* L. Sp. Pl. (ed.2) 1051. 1763. *Desmodium reniforme* (L.) DC. Prodr. 2:327. 1825; FBI 2:173; C 1:380.

A slender herb, with wiry stems. Leaflet broader than long, reniform, glabrous. Flowers in terminal racemes. Pods 1.5–1.8 cm long, glabrous, upper suture straight, lower one slightly indented.

Listed by Santapau (1962) from Saurashtra. It is also collected by Indraji J. Thaker from Barda hills. (MANO-PANDARIYO)

Desmodium repandum (Vahl) DC. Prodr. 2:334. 1825; S & J 18. *Hedysarum repandum* Vahl, Symb. Bot. 2:82. 1791. *Desmodium scalpe* DC. Prodr. 2:334. 1825; FBI 2:165.

An erect herb or undershrub, viscidly hairy, 25–40 cm tall. Leaflets 1.2–5.5×0.8–2.8 cm, ovate. Flowers purplish, in terminal and lateral, simple or branched racemes. Pods 3–6-jointed, deeply constricted along both sutures, hairy; hairs hooked.

Listed by Santapau from Saurashtra as common in thin forest at Sasan and at the foot of Girnar mountain.

FLS:Aug.–Oct. *FRS* : Oct.

Desmodium rotundifolium Baker in Hk. f. FBI 2:172. 1876; C 1:381; S 63. *Alysicarpus beddomei* Sensu Ch & O, Fl. Pavagadh 72. 1966 (non Schindl.).

Suberect, slender herbs, 30-60 cm tall, branched from base, 0.8–4×0.8–3 cm, rotund, obovate or broadly elliptic, membranous, appressed-hairy beneath. Flowers bright-purple, in 5–15 cm long, axillary and terminal, lax racemes. Pods 0.8–1.2 cm long, glabrescent, straight, 3–6-jointed.

Reported from Dangs and Pavagadh only among grasses. Occasional.

FLS & FRS : Aug.–Sep.

Desmodium triangulare (Retz.) Santapau var. **congestum** (Prain) Santapau in Kew Bull. 1948:276. 1948; S 61. *Desmodium cephalotes* Wall. ex Baker in Hk. f. FBI 2:161. 1876 p. p. *Desmodium cephalotes* Wall. ex Baker var. *congestum* Prain in Journ. As. Soc. Bengal 66:389. 1898; C 1:375.

An erect shrub or undershrub, 90-150 cm tall; stem and branches sericeo-pubescent in younger parts. Leaflets 4-8.6×2.2-4.2 cm, elliptic-oblong, obovate-oblong or lanceolate, argento-silky-pubescent beneath. Pods 1-3 cm long, brown, slightly falcate, pubescent, constricted between seeds.

Scanned by CamScanner

Mostly found along river banks in forest undergrowth in South Gujarat.

FLS: Sep.-Oct. *FRS*: Nov.-Dec.

Desmodium triflorum (L.) DC. Prodr. 2:234. 1825; FBI 2:173; C 1:378; Ch & O 73; S & J 18; S 62. *Hedysarum triflorum* L. Sp. Pl. 749. 1753.

Prostrate or trailing, slender, glabrous or sparsely hairy herbs, rooting at nodes. Leaflets 0.4–1.2×0.3-0.8 cm, membranous, sessile or subsessile, obovate, glabrous or sparsely hairy beneath. Pods 0.5-1.8 cm long, 4–6-jointed, laterally compressed, falcate, appressed-hairy, somewhat woody. Seeds subquadrate, greenish-brown, smooth, glabrous.

Throughout, gregarious in moist ground.

FLS & FRS: Throughout the year.

Desmodium triquetrum (L.) DC. Prodr. 2:237. 1825; FBI 2:163 p.p.; C 1:378; S & J 18. *Hedysarum triquetrum* L. Sp. Pl. 746. 1753.

Erect undershrubs, 60–100 cm tall, with triquetrous often reddish-purple branches. Leaflets 9.2–20×2.8–9.3 cm, ovate-oblong or ovate-lanceolate, glabrous. Racemes 15–30 cm long, axillary and terminal. Pods 1.6–2.5×0.3-0.6 cm, 4–8-jointed, appressed-grey-pubescent. Seeds 0.1-0.2 cm long, yellowish, reniform, smooth, glabrous.

Sparingly seen in forest undergrowth in Dangs and Saurashtra.

FLS & FRS: Sep.-Nov.

Desmodium velutinum (Willd.) DC. Prodr. 2:328. 1825; S & J 18. *Hedysarum velutinum* Willd. Sp. Pl. 3:1174. 1802. *Hedysarum latifolium* Roxb. Hort. Beng. 57. 1814 (nomen) ex Ker. Bot. Reg. 5. Pl. 355 & Descr. 1819. *Desmodium latifolium* (Roxb. ex Ker.) DC. Prodr. 2:328. 1825; FBI 2:168 (excl. *D. virgatum* Zoll.); C 1:380.

Undershrubs, 60–120 cm tall, fulvous-pubescent. Leaflets 4.5–13.6×2.8–10.6 cm, broadly ovate or suborbicular, scabridly hairy above, densely so beneath, fulvous-ciliate on margins. Flowers distantly fascicled, on 10–30 cm long, axillary and terminal racemes. Pods 1.2–2.5 cm long, 3–6-jointed, densely pubescent, apiculate.

Occasional in the forest undergrowth, rarely along river banks and road sides in Central and South Gujarat.

FLS & FRS: Aug.-Nov.

DOLICHOS L. *excl. Lablab* Adans.

Dolichos trilobus L. Sp. Pl. 726. 1753; Verdcourt in Taxon 17: 170. 1968 & Kew Bull. 24:422. 1970. *Dolichos falcatus* Klein ex Willd. Sp. Pl. 3:1047. 1802; FBI 2:211; S & J 18.

A diffuse, glabrous to sparsely hairy, twining herb. Leaflets 1.5–5.2×0.9–3.2 cm, ovate or ovate-rhomboid, membranous, glabrescent, subsessile. Flowers 1.2–1.7 cm long, lilac or purple, 1–3, in axillary fascicles. Pods 3.5–6.5×0.8–1.2 cm, glabrous, linear-oblong, subfalcate, apiculate glaucous-green. Seeds 0.4×0.2 cm, reddish-brown, ellipsoid-oblong, smooth, glabrous.

Dangs, Chhotaudepur and Saurashtra; occasional. (JANGLI PAPDI)

FLS & FRS: Sep.-Oct.

DUNBARIA W. & A.

Dunbaria glandulosa (Dalz. & Gibs.) Prain in Journ. As. Soc. Bengal 433. 1898; C 1:411. *Cajanus glandulosus* Dalz. & Gibs. Bombay Fl. 73. 1861. *Atylosia rostrata* Baker in Hk. f. FBI 2:216. 1876.

An extensive woody twiner, yellowish-or greyish tomentose in younger parts. Leaflets 3–10.5×2.5–10.2 cm, subcoriaceous, thinly hairy above, tomentose beneath, terminal leaflet rhomboid-ovate and equal-sided, lateral ones ovate, unequal-sided. Flowers

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bright-yellow, distant, on 6.5–23 cm long, silky-pubescent, terminal and axillary racemes. Pods 5–8.5×0.8–1.3 cm, flat, linear, densely covered with yellow bristles from bulbous bases.

Bulsar, on hedges; rare.

FLS & FRS : Aug.–Oct.

ELEIOTIS DC.

Eleiotis monophylla (Burm. f.) DC. Mem. Legum. 2:350. 1825; *Glycine monophylla* Burm. f. Fl. Ind. 161. t. 50. f. 2. 1768. *Hedysarum sororium* L. Mant. 2:270. 1771. *Eleiotis sororia* (L.) DC. Mem. Legum. 2:350. 1825; FBI 2:153; C 1:364.

Annual, prostrate or procumbent, glabrous herbs. Leaves 1–3-foliolate, petiolate; leaflets 1–4.5 × 0.8–5 cm, ovate-orbicular or subreniform, membranous, sparsely hairy beneath Flowers pale- to creamy-yellow, in compact, axillary racemes, at ends of 4–6.5 cm long, slender, hairy peduncle. Pods 0.2–0.5 cm long, boat-shaped, compressed, brown. Seeds dark-brown, polished, subreniform.

Among grasses in North, Central and South Gujarat; occasional.

FLS & FRS : Aug.–Nov.

ERYTHRINA L.

Key to species

1. Calyx more or less 2-lipped; bark yellowish-brown, wrinkled .. .. *E. suberosa*

1. Calyx not 2-lipped; bark grey, not wrinkled .. *E variegata*

Erythrina suberosa Roxb. Hort. Beng. 53. 1814 (nomen) & Fl. Ind. 3:253. 1832; FBI 2:189; C 1:392; WI 3:196. Pl. 20 (col.) & f. 126; Ch & O 90; S & J 18.

5–6 m tall, deciduous trees. Leaflets 15–13.8 × 5.5–14.3 cm, pubescent beneath, terminal leaflet rhomboid-ovate, lateral ones

obliquely broadly ovate-cordate. Flowers scarlet, in 3–5 cm long racemes. Pods 6–10.2 cm long, torulose, glabrous, beaked, constricted Seeds 1–1.2 cm. long, oblong, smooth, glabrous.

In all zones (except Kutch), mostly near river banks in forests; rare. (JAGRAIYO–KHAKHARO; JANGHARIYO)

FLS & FRS: Apr.–Nov.

Erythrina variegata L. in Stickm. Herb. Amb. 10.1754 & Amoen. Acad. 4:122. 1759. *Erythrina indica* Lam. Encycl. 2:391. 1786; FBI 2:88; C 1:390; S & J 18.

Deciduous trees. Leaflets 3.2–11.5 × 2.6–13.4 cm, broadly ovate or ovate-rhomboid. Flowers coral-red, in 6–9.5 cm long dense racemes. Pods 9–12 cm long, black, torulose. Seed 1.5×1 cm, ellipsoid-oblong, reddish-brown glabrous, smooth.

Planted at some places. (PANGARO, PANGARA)

FLS: Feb–Apr. *FRS*: Best part of the year.

GEISSASPIS W. & A.

Geissaspis cristata W. & A. Prodr. 1:213. 1834; FBI 2:141; C 1:353.

A diffuse or procumbent, 15–25 cm tall herb. Leaves abruptly pinnate, 1–1.5 cm long, petiolate; leaflets 0.4–1.2×0.3–0.6 cm, obovate, glabrous, sessile. Flowers yellow with reddish purple streaks, in 1.5–3.6 cm long, axillary and terminal racemes. Bracts 0.6–1.4 cm across, orbicular or reniform, with bristly margins. Pods moniliform, 1–2-jointed, joints 0.3–0.5 × 0.2–0.3 cm, glabrous, reticulately veined, suborbicular or plano-convex. Seeds 0.2–0.25 cm long, oblong, glabrous, smooth, dull-yellowish-brown.

Dangs among grasses; rare.

FLS & FRS : Aug.–Oct.

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GLIRICIDIA H. B. & K.

Gliricidia sepium (Jacq.) Walp. Repert. Syst. 1:679. 1842; Bailey 560. *Robinia sepium* Jacq. Enum. Pl. Carib. 28. 1760. *Gliricidia maculata* H. B. & K. Nov. Gen. et Sp. 6:393. 1823.

Deciduous trees, 2.5–5 m tall; bark smooth, greenish-brown, lenticellate. Leaves 15–30 cm long; leaflets 2.5–9×1.4–4.5 cm, ovate-oblong or elliptic-lanceolate, somewhat thick, coriaceous, glaucous-green, glabrous. Flowers 1–2.5 cm long, rosy-pink, lilac or nearly white, in 5–15 cm long, erect or drooping racemes. Pods 8–15×1–1.5 cm, flat, linear, glabrous, pendent. Seeds 0.3×0.2 cm, compressed, elliptic, yellowish.

Planted in gardens and seldom along roads; an ornamental.

FLS : Dec.–Apr. *FRS* : Feb.–May

GLYCINE L.

Glycine wightii (Grah. ex W. & A.) Verdcourt in Kew Bull. 15:35. 1966. *Notonia wightii* Grah. ex W. & A. Prodr. 207. 1834. *Glycine javanica* auct. non L. 1753; FBI 2:183; C 1:386; WI 4:159; S & J 18.

An extensive, herbaceous twiner, densely clothed with grey or fulvous tomentum. Leaflets 2.5–9.2×1–5.2 cm, ovate, or ovate-elliptic, appressed-hairy, shortly petiolulate. Flowers reddish-purple, rarely white, in 5–12 cm long, axillary racemes. Pods 1.4–5×0.5–1 cm, linear, compressed, constricted between seeds, clothed with dense, brown hairs. Seeds 1–4, 0.6–0.8×0.4–0.5 cm, yellowish, ovate to ovate-elliptic, glabrous, smooth.

Cultivated, at times an escape. (SOYABEAN)

FLS & FRS : July–Nov.

• GONIOGYNA DC.

Goniogyna hirta (Willd.) Ali in Taxon 16:463. 1967. *Hallia hirta* Willd. Sp. Pl. 3(2):1169. 1802. *Heylandia latebrosa* DC. Mem. Leg. 201. 1825; FBI 2:65; C 1:310; Ch & O 85; S & J 18; S 51 (non *Hedysarum latebrosum* L. 1753).

Prostrate herbs, with 10–45 cm long, slender, patently hairy branches. Leaves 0.5–1.4×0.3–0.6 cm, alternate, subsessile, ovate, glabrous or sparsely hairy, ciliate on margins. Flowers 0.2–0.4 cm long, yellow, axillary, solitary. Pods 0.3–0.4 cm long, brown, oblong, flat, 2-seeded, sparsely hairy or nearly glabrous. Seeds 0.1–0.2 cm long, brown, smooth, polished, subreniform.

Throughout, among grasses; common.

FLS & FRS : Aug.–Mar.

INDIGOFERA L.

Key to species and varieties

1. Leaves simple :
2. Leaves linear to linear-oblong .. .. .. *I. linifolia* var. *linifolia*
3. Leaves obovate or ovate-elliptic .. .. *I. linifolia* var, *campbellii*

2. Leaves broadly ovate to ovate-oblong, cordate at base; flowers axillary, solitary or in fascicles of 4–8; pods 1–2-seeded .. .. *I. cordifolia*

1. Leaves compound :
4. Flowers in axillary, sessile or short peduncled heads :
5. Leaflets 3, nigro-punctate beneath; pods 1–2-seeded, winged on angles.. .. .. *I. glandulosa*
5. Leaflets 5–11, not punctate beneath; pods 2–4-seeded, not winged :
6. Plants argento-canescent; leaflets elliptic or oblanceolate; pods linear-cylindric, curved, silvery-hairy, 3–4-seeded.. .. .. *I. sessiliflora*
6. Plants and pods not as above; leaflets obovate; pods oblong, 2(–3)-seeded.. .. .. .. *I. linnaei*

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4. Flowers in axillary racemes :
7. Pods quite flat and papery.. .. ..*I. hochstetteri*
7. Pods not as above :
8. Leaflets alternate :
9. Leaflets argento-canescent; pods torulose :
10. Plants shruby; pods 6–8-seeded.. .. ..*I. oblongifolia*
10. Plants herbaceous; pods 1–3-seeded.. .. ..*I. angulosa*
9. Leaflets not argento-canescent; pods not torulose .. .. *I. spicata*
8. Leaflets opposite :
11. Leaflets 3 :
12. Leaflets nigropunctate, atleast beneath :
13. Pods stout or not, slightly deflexed, 1–1.2 cm long, narrowly winged on angles, 4–6-seeded, not torulose; leaflets oblanceolate, emarginate, terminal leaflet sessile; plants stout.. .. .. ..*I. trifoliata*
13. Pods slender, 1.5–1.7 cm long, much deflexed, sparsely winged on angles, 8-seeded; leaflets obovate, obtuse or acute, terminal leaflet shortly petiolulate; plants slender.. .. .. ..*I. prostrata*
12. Leaflets not nigropunctate :
14. Leaflets elliptic–oblong; racemes 5 cm or more long.. ..*I. trita* ssp. *trita* var. *maffei*
14. Leaflets obovate–oblong : racemes upto 5 cm long.. ..*I. trita* ssp. *trita* var. *trita*

11. Leaflets 5 .. .. *I. glabra*
11. Leaflets (5) 7, 9 or 11 (seldom 13 in *I. tinctoria*):
15. Racemes 3–6-flowered .. .. *I. tenuifolia*
15. Racemes 6–12-flowered :
16. Pods vicidly-hairy, torulose .. *I. colutea*
16. Pods not as above .. .. *I. parviflora*
15. Racemes more than 12-flowered :
17. Pods cylindric :
18. Pods thinly, hairy, torulose, 1–4-seeded, not deflexed :
19. Pods 0.5–0.8 cm long, 1(–2)-seeded ... .*I. caerulea* var. *monosperma*
19. Pods 0.8–1.2 cm long, 3–4-seeded .. ..*I. caerulea* var. *occidentalis*
18. Pods glabrous, not torulose, deflexed, many-seeded .. .. .. *I. tinctoria*
17. Pods tetragonous or subtetragonous :
20. Pods densely pubescent, not torulose, deflexed .. .. .. *I astragalina*
20. Pods thinly hairy, torulose, not deflexed .. .. *I. constricta*
11. Leaflets 13–21 but flowers largest for the genus .. .. *I. cassioides*

Indigofera angulosa Edgew. Journ. As. Soc. Bangal 22:168. 1853; FBI 2:97; Chavan in Proc. Autumn School in Botany 64. 1966 (published 1970); Patel A. I. Flora of Rajpipla 207. 1972.

50–100 cm tall, argento-canescent undershrubs. Leaflets 3–5, 2.4–4.3 × 0.8–1.3 cm, elliptic–lanceolate or obovate, silvery-grey-pubescent. Flowers red, in 10–25 cm long, lax racemes. Pods 0.6–0.8 cm long, argento-canescent, shortly mucronate, torulose. Seeds 0.2–0.3 cm long, ellipsoid, blackish-brown, smooth, glabrous.

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Rare, reported from Khedbrahma in North Gujarat and Rajpipla forest in South Gujarat.

FLS & FRS : Oct.

Indigofera astragallina DC. Prodr. 2:228. 1825; Ch & O 78; S & J 18. *Indigofera hirsuta* Sensu Baker in Hk. f. FBI 2:98. 1879; C 1:339 (non L.).

Densely-pubescent to woolly-tomentose, suffrutescent, 50–100 cm tall undershrubs. Leaflets 2.5–6.5 × 1.5–2.8 cm, opposite, elliptic-oblong or ovate-oblong, appressed-pubescent, shortly petiolulate. Flowers 0.3–0.6 cm long, bright-scarlet to rosy-purple, in axillary and terminal, 4.2–15 cm long, compact racemes. Pods 0.6–1.8 cm long, deflexed, slightly mucronate. Seeds 0.2–0.3 cm long, pale-greenish-brown to blackish-brown, glabrous.

Throughout, common.

FLS & FRS : Aug.–Dec.

Indigofera caerulea Roxb. var. **monosperma** (Santapau) Santapau in Fl. Saurashtra 1:130–131. 1962; S & J 18. *Indigofera articulata* var. *monosperma* Santapau in Proc. nat. Inst. Sci. India 24B:135. t. 1. 1958.

An erect, argento-canescent undershrub. Leaves 7–13 cm long with argento-canescent rachis; leaflets 0.6–1.5 × 0.3–1 cm, elliptic-obovate or suborbicular. Flowers red, upto 50, in axillary racemes. Pods elliptic-oblong, greenish-brown to light-black, nearly glabrous atlength. Seeds reniform, olive-green, shining, glabrous, smooth.

Kutch and Saurashtra; rare.

FLS & FRS : Aug.–Oct.

Indigofera caerulea Roxb. var. **occidentalis** Gillett & Ali in Kew Bull. (Add. Ser. 13) 102. 1958; Ch & O 77; S & J 18. *Indigofera articulata* Cooke, Fl. Pres. Bombay 315. 1902 & 1:336.

1958 (reprinted) et al. auct. (non Gouan 1773). *Indigofera argentea* Sensu Thaker J. I. Fl. Barda hill 194. 1910 (non Burm. f. 1768). *Indigofera houer* Sensu Santapau Pl. Saurashtra 13. 1953.

An erect, argento-canescent shrub, 75–90 cm tall. Leaves 3–7.5 cm long, petiolate; leaflets 0.5–3.2 × 1.2–2.4 cm, obovate, appressed-pubescent. Flowers red, 18–30, in 2.3–15 cm long, axillary racemes. Pods slightly torulose, turgid, shortly mucronate, silvery-hairy when young, at length glabrescent.

Saurashtra and Broach (Nikora and Dehaj); frequent. (GADO, GUDO, JANGLI GALI).

FLS & FRS: June-Aug.

Indigofera cassioides Rottl. ex DC. Prodr. 2:225. 1825; *Indigofera pulchella* Roxb. Hort. Beng. 57. 1814 (nomen) & Fl. Ind. 3:382. 1832; FBI 2:101; C 1:341. WI 5:181.

An erect, glabrous or sparsely hairy shrub. Leaves 8–15 cm long; leaflets 1–2.3 × 0.8–1.2 cm, elliptic-oblong, thinly-appressed-pubescent. Flowers bright-rosy-purple, in 6.5–21 cm, long, axillary, dense racemes. Pods 1.5–4 cm long, straight, cylindric, glabrous. Seeds 8–12, 0.1–0.2 cm long, reddish-brown, elliptic, glabrous, smooth.

Reported from Ratan Mahals by Dr. Bedi (1961); there is also a sheet at National Botanic Garden, Lucknow of this species collected along Junagadh-Veraval road in Saurashtra.

FLS & FRS: Aug.-Oct.

Indigofera colutea (Burm. f.) Merr. in Philip. Journ. Sci. 19:355. 1921; Ch & O 76; S & J 18. *Galega colutea* Burm. f. Fl. Ind. 172. 1768. *Indigofera viscosa* Lam. Encycl. Meth 3:247. 1789; FBI 2:95; C 1:337.

Erect, suffruticose, 30–45 cm tall, appressed-glandular-villous annuals. Leaves 2–4 cm long, alternate; leaflets 0.4–0.8 × 0.2–0.4 cm, obovate-elliptic, opposite, sessile, appressed-white hairy beneath. Racemes 2–2.5 cm long, axillary, lax racemes.

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Pods 1–1.5 cm long, straight, subcylindric, shortly beaked. Seeds minute, quadrate to subquadrate, truncate at both ends, smooth, glabrous, yellowish-brown.

Rajpipla, Pavagadh and Saurashtra, in forest undergrowth; rare.

FLS & FRS: Sep.-Oct.

Indigofera constricta Trim. Cat. Ceyl. Pl. 23. 1885; C 1:340; S & J 18.

Listed by Santapau (1962) from Saurashtra on the basis of a collection at Vijarkhi lake near Jamnagar on 26th Oct. 1945.

FRS: Oct.

Indigofera cordifolia Heyne ex Roth, Nov. Pl. Sp. 357. 1821; FBI 2:93; C 1:331; WI 5:176; Ch & O 75; S & J 18.

A prostrate or trailing, copiously branched, radially spreading, pubescent to tomentose or almost woolly herb. Leaves 0.7–2 ×0.5–1.5 cm, nearly sessile, appressed-hairy. Flowers bright-red, Pods 0.2–0.6 cm long, terete, oblong, minutely beaked, densely pubescent to almost woolly. Seeds ±0.1 cm long, glabrous, globose, truncate at one end, very shallowly pitted.

Throughout; common and abundant.

FLS & FRS: Throughout the year.

Indigofera glabra L. Sp. Pl. 751. 1753; C 1:337. *Indigofera pentaphylla* Murr. Syst. Veg. ed. 13:564; FBI 2:95.

Annuals. Leaves imparipinnate; leaflets opposite, 0.4–1.6× 0.2–0.9 cm, obovate-oblanceolate, appressed-pubescent. Flowers purple-red, 2–4, in 2.8–3.5 cm long, terminal and axillary racemes. Pods 1–2 cm long, subcylindric or obscurely 4-gonous. Seeds 10–12.

Chhotaudepur forest division (Bunjer).

FLS & FRS: Aug.-Oct.

Indigofera glandulosa Roxb. ex Willd. Sp. Pl. 3:1227. 1800; FBI 2:94; C 1:332; S & J 18; S 55.

Erect herbs, 20–40 cm tall, glabrous or nearly so in older parts. Leaflets 0.8–3.5 × 0.4–1.2 cm, elliptic-obovate or oblanceolate, membranous, appressed-hairy. Flowers red, in dense axillary clusters. Pods 0.4–0.7 cm long, deflexed, linear-oblong, densely -pubescent. Seeds 0.3–0.4 cm across, brown, glabrous, smooth, subreniform.

Throughout among grasses; common.

FLS & FRS Aug.-Dec.

Indigofera hochstetteri Baker in Oliv. Fl. Trop. Afr. 2:108. 1871; S & J 18. *Indigofera anabaptista* Steud. ex Baker in Hk f. FBI 2:102. 1876; C 1:334.

Undershrubs, 30–45 cm tall, appressed-white-hairy. Leaves 1.5–3 cm long, petiolate; leaflets 5, 1–2.2×0.4–0.8 cm, oblong, obovate-oblong or oblanceolate, appressed-hairy. Flowers red, 12–20, in dense, axillary racemes. Pods 1–2.2 cm long, linear, flat, falcate, papery, appressed-pubescent. Seeds 6–8, ±0.1 cm across, discoid, pale-brown, glabrous.

Bulsar, Broach, Saurashtra and Kutch; not common. (BETHI GALI)

FLS & FRS: Aug.-Nov.

Indigofera linifolia Retz. var. **campbellii** Wt.; C 1:331.

Diffuse herbs, with appressed-pubescent branches. Leaves 0.4–1.5×0.2–0.4 cm, appressed-pubescent. Flowers bright-red. Pods 0.1–0.2 cm long, globose, appressed-hairy. Seed brownish -black, globose, very shallowly pitted.

Chhotaudepur and Rajpipla forest divisions, Broach along river Narmada, Ankleshwar and Surat; not as common as var. *linifolia*.

FLS & FRS: July-Feb.

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Indigofera linifolia Retz. var. **linifolia**. *Indigofera linifolia* Retz. Obs. Bot. 4:29. 1786; FBI 2:92; C 1:330; Ch & O 74; S & J 18; S 55.

Prostrate, copiously branched, appressed-pubescent herbs, somewhat woody near base. Leaves 0.4–2.2 × 0.2–0.5 cm, appressed-hairy, sessile. Flowers red. Pods 0.1–0.2 cm long, globose, glistening with appressed-silvery-white pubescence. Seed brownish-black, globose, very shallowly pitted.

Throughout; common. (JINKIGALI, NAHNIGALI.)

FLS & FRS : July–Feb.

Indigofera linnaei Ali in Bot. Notis. 111:549. 1958; Ch & O 75; S & J 19. *Hedysarum prostratum* L. Mant. 1:102. 1767. *Hedysarum prostratum* Burm. f. Fl. Ind. 168. t. 55. f. 1. 1768. *Indigofera enneaphylla* L. Mant. 2:571. 1771 (nom. illegit.); FBI 2:94; C 1:332. *Indigofera prostrata* (Burm. f.) Domin. in Bibl. Bot. Stutt. 187. 1926 (non Willd. 1803).

Prostrate herbs with radially spreading, appressed-hairy or glabrescent branches. Leaves alternate, 0.8–2.6 cm long; leaflets 5-9(–11), 0.2–0.5 × 0.1–0.3 cm, obovate, subcoriaceous, appressed-hairy. Flowers red. Pods 0.2–0.4 cm long, apiculate, more or less appressed-pubescent. Seeds globose, brown, smooth.

Throughout; common. (FATAKIYA, BHONYGAL)

FLS & FRS : July–Dec.

Indigofera oblongifolia Forsk. Fl. Aegypt.-Arab. 137. 1775; S & J 19. *Indigofera paucifolia* Del. Fl. D'Eg. 251. 1813; FBI 2:97; C 1:334.

Twiggy shrubs, 75–150 cm tall, argento-canescent in younger parts. Leaves imparipinnate, 2–5 cm long, petiolate; leaflets 3–5, 0.4–2.1 × 0.2–0.8 cm, alternate, elliptic-lanceolate, oblanceolate or oblong, appressed-white-hairy. Flowers red, in 1–2.5 cm long

racemes. Pods 0.5–1.5 cm long, torulose, appressed-hairy. Seeds 4–6, ±0.1 cm long, oblong, smooth, yellowish-to reddish-brown, truncate at one end.

Throughout, in plains in dry areas; occasional. rarther rare in areas of relatively more rainfall (ZIL, ZILADI, ZILDO)

FLS & FRS : April Dec.

Indigofera parviflora Heyne in Wall. Cat. no 5457. 1828 (*nomen*) ex W. & A. Prodr. 201. 1834; FBI 2:97; C 1:338.

Annuals, 20–45 cm tall, slender, argento-canescent. Leaves 3–5 cm long; leaflets 7–9, 0.6–1.2 × 0.2–0.6 cm, linear-oblong, elliptic-oblong or oblanceolate, membranous. Flowers reddish-purple, in 0.8–1.2 cm long, lax racemes. Pods 1.2–2.2 cm long, appressed-hairy, deflexed, recurved at tip.

In the forest undergrowth at Ambadungar and Kadipani in Chhotaudepur forest division; very rare; also reported by Blatter (1908) from Kutch.

FLS & FRS : Sep.–Oct.

Indigofera prostrata Willd. Sp. Pl. 3:1226; 1802; S 55. *Indigofera trifoliata* Sensu Baker in Hk. f. FBI 2:96. 1876; C 1:335 (omne p. p.)

Prostrate or diffuse herbs, 15–30 cm tall. Leaves 3-foliolate; leaflets 1–2.5 × 0.4–0.9 cm, sessile or subsessile, obovate, appressed-hairy, nigro-punctate beneath. Flowers red, in axillary racemes. Pods 1–1.8 cm. long, deflexed, brown, glabrescent, minutely winged along sutures.

Not common. Vyra, Dangs and Bulsar, among grasses.

FLS & FRS : Aug.–Oct.

Indigofera sessiliflora DC. Prodr. 2:228. 1825; Ch & O 76. *Indigofera trigonellioides* non Jaub. & Spach. Illus 5:92. t. 482. 1857; FBI 2:94; C 1:332.

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Slender, caespitose, appressed-white-hairy herbs, 9-15 cm tall. Leaves 5-7-foliolate, 1.4-3.6 cm long; leaflets 0.4-1.6 ×0.6-1.8 cm, appressed-white-hairy. Flowers red. Pods 0.6-1 cm long, linear-cylindric straight, torulose, silvery-hairy, 3-4-seeded.

Pavagadh and Broach, among grasses; rare.

FLS : July-Oct. *FRS*: Aug.-Oct.

Indigofera spicata Forsk. Fl. Aegpt.-Arab. 138. 1775. *Indigofera endecaphylla* Jacq Coll. 2:358. 1788 & Icon. Pl. Rar. t. 570; FBI 2:96; C 1:334.

Diffuse or suberect, 30-90 cm. tall, glabrous herbs. Leaves 2-4.6 cm long, alternate; leaflets 5-11, subsessile, 0.8-2×0.3-1.2 cm, oblaceolate, appressed-grey-pubescent. Flowers violet-purple, in 3.8-8 cm long, axillary, dense racemes. Pods 1.5-2.6 cm long, numerous, deflexed, 4-gonous, straight, 6-8-seeded.

Dangs along bank of Purna river at Mahal; abundant.

FLS & FRS : Oct.-Dec.

Indigofera tenuifolia Rottl. ex W. & A. Prodr. 200. 1834; FBI 2:95; C 1:337; S & J 18.

A prostrate herb, glabrous or nearly so. Leaflets 0.6-0.8× 0.2-0.25 cm, oblanceolate, appressed-white-hairy. Flowers minute, in axillary racemes, longer than leaves. Pods 1.8-2.5 cm long, linear, torulose.

Saurashtra, in dry river beds at Sasan in Gir forest; also cited by Cooke from South Gujarat (Ankleshwar).

FLS & FRS : Sep.-Oct.

Indigofera tinctoria L. Sp. Pl. 751. 1753; FBI 2:99; C 1:339; Bailey 562; WI 5:182. f. 113; Ch & O 77; S & J 19.

40-150 cm tall, erect, appressed-hairy to nearly glabrous shrubs. Leaves 2.4-7.6 cm long, alternate; leaflets 0.4-2.8×0.2-0.8 cm, oblong to nearly obovate, hairy beneath. Flowers red,

in 1.5-4.5 cm long, axillary, spicate racemes. Pods 1.5-4.2 cm long, linear, slightly falcate, stiff, deflexed, brown. Seeds ± 0.2 cm long, brown, cylindric, glabrous, truncate at ends.

Throughout; not common. (GALI, NIL, GUDI)

FLS & FRS : Aug.-Jan.

Indigofera trifoliata L. Cent. Pl. 229. 1756 & Amoen. Acad. 4:327. 1759; FBI 2:96 p. p.; C 1:335 p. p.; WI 5:182. f. 113; S & J 19.

Perennial, suffruticose herbs, 20-30 cm high, with white or grey-appressed hairs. Leaves 3-foliolate; leaflets 0.8-2.6×0.5-0.9 cm, glabrous above, appressed-pubescent beneath. Flowers red, sessile, in dense racemes. Pods thinly pubescent.

Reported from Saurashtra; at Broach rare among grasses.

FLS & FRS : Aug.-Sep.

Indigofera trita L. f. subsp. *trita* var. *maffei* (Chiov.) Ali in Bot. Notis. 111:559. 1958. *Indigofera maffei* Chiov. in Atti Ist. Bot. Univ. Pavia (Ser.4) 7:128. t. 5. 1936. *Indigofera oreophila* Santapau & Panthki in Journ. Bombay nat. Hist. Soc. 54:222-224. Pl. on p. 224. 1956. *Indigofera trita* L. var. *maffei* (Chiov.) Gillett in Kew Bull. Add. Ser. 13:101. 1958.

100-150 cm tall, hairy undershrubs. Leaflets 1.8-5×0.7-2 cm., appressed-hairy. Flowers red, in 5-10 cm long, axillary racemes. Pods 1-1.8 cm long, deflexed, grey-pubescent, apiculate, straight. Seeds 6-8, minute, cylindric, truncate, brownish, glabrous.

So far from Dangs and Vyara.

FLS & FRS : Sep.-Dec.

Indigofera trita L. f. subsp. **trita var. trita;** Ali in Bot. Notis. 111:558. 1958. *Indigofera trita* L. f. Suppl. 355. 1781; FBI 2:96; C 1:335; Ch & O 76; S & J 19.

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30–90 cm tall, thinly to densely appressed-hairy undershrubs. Leaflets 0.5–4.7×0.4–2.2 cm, terminal one largest, appressed-hairy. Flowers red, in axillary racemes. Pods 2.5–3 cm long, linear, apiculate, not torulose, 4-gonous, appressed-grey-pubescent, obliquely deflexed. Seeds oblong, obtuse at ends, glabrous, pale-to dark-brown, smooth.

Throughout, not common.

FLS & FRS : July-Feb.

LABLAB Adans.

Lablab purpureus (L.) Sweet, Hort. Brit. (ed. 1) 481. 1827. Verdcourt in Kew Bull. 24:410. 1970. *Dolichos lablab* L. Sp. Pl. 725. 1753; FBI 2:209; C 1:406; Bailey 575; WI 3:104. Pl. 12. & ff. 61 & 63; S & J 18. *Dolichos purpureus* L. Sp. Pl. (ed.2) 1021. 1763. *Lablab niger* Medic in Vorles Churfp. Phys. Ges. 2:354. 1787. *Lablab vulgaris* Savi, Diss. 19. 1821 & Obs. Phas. & Dol. 19. 1822.

Extensive twiner. Leaflets 2–13×1.6–11.5 cm, broadly ovate–rhomboid or elliptic-ovate, at length glabrescent. Flowers white or pale-creamy-yellow, in 10–30 cm long, terminal and axillary racemes. Pods 4–12.5×0.4–1 cm strongly falcate, linear-oblong, compressed, glabrous or nearly so. Seeds 0.6–1×0.4–0.6 cm, oblong, glabrous, pale-yellow when mature.

Cultivated; also an escape. (VAL, VALPAPRI)

FLS & FRS : Oct.–May

LATHYRUS L.

Key to species

1. All leaflets modified into tendrils; stem not winged; flowers yellow.. .. .. ..*L. aphaca*
1. Upper leaflets only modified into tendril; stem winged; flowers at least not yellow :

2. Cultivated as an ornamental; climbing herbs; stipules small, not foliaceous ; flowers white, rosy or purple, fragrant, in racemes.. .. ..*L. odoratus*
2. Cultivated as crop plant, but also an escape; diffuse or ascending herb but not climbing; stipules foliaceous; flowers violet or bluish-purple, axillary, solitary.. .. ..*L. sativus*

Lathyrus aphaca L. Sp. Pl. 729. 1753; FBI 1:179; WI 6:41.

Glabrous herbs. Leaflets modified into 2.5–3 cm long tendrils; stipules 1.5–2.5×0.8–1.2 cm, ovate-triangular, glabrous. Flowers solitary, axillary, on 2.5–3 cm long, glabrous peduncle.

An escape in Sabarmati river near Ahmedabad (specimen in Gujarat College herbarium, Ahmedabad, collected by R. N. Sutaria).

FLS : Jan.

Lathyrus odoratus L. Sp. Pl. 732. 1753; Bailey 551; WI 6:37.

Annual, glabrescent herbs. Leaflets 1.7–5.9×0.3–2.4 cm, broadly ovate–oblong, appressed-hairy at least in younger parts. Pods 5–5.6×0.8–1 cm, flat, hairy. Seeds globose, greyish-brown.

Ornamental.

FLS & FRS : Aug.–Feb.

Lathyrus sativus L. Sp. Pl. 730. 1753; FBI 2:179; C 1:384; Bailey 551; WI 6:37. ff. 19–20.

Glabrous herbs. Leaflets 2.3–6.5×0.2–1.3 cm, sessile, dark-green, linear-lanceolate, glabrous. Pods 3.2–3.7 cm long, winged on either side of dorsal suture, glabrous, compressed. Seeds 4–5, brown or yellowish, mottled with red dots, compressed.

Cultivated or an escape. (LANG)

FLS & FRS: Dec.–Jan.

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LOTUS L.

Lotus garcini DC. Prodr. 2:212. 1825; FBI 2:91; C 1:328; S & J 19.

An erect, hairy herb or undershrub. Leaves 3–5-foliolate; leaflets 0.6–0.8×0.4–0.5 cm, obovate-cuneate, subsessile, fleshy. Flowers white with red or reddish nerves, solitary, axillary. Pods 0.8–1.3 cm long, compressed, appressed-pubescent. Seeds black, elliptic, glabrous, smooth.

Kutch and Saurashtra, on sandy sea shore. (MOTOBHA-KHO, VAN-METHI, VADO-BHAKHO)

FLS & FRS: Oct.–Dec.

LUPINUS L.

Lupinus albus L. Sp. Pl. 721. 1753; Bailey 566; WI 6:183. t.65.

Annual, erect, 10–40 cm tall, appressed-hairy herbs. Leaves digitately 5–7-foliolate, petiolate; leaflets 5–7, 0.8–3.6×0.2–0.7 cm, obovate-oblong, appressed-pubescent beneath. Flowers white, in 5–28 cm long, terminal, erect racemes. Pods 1–2×0.2–0.4 cm, densely hairy, compressed, oblong-cylindric, 3–5-seeded. Seeds 0.1–0.3 cm long, elliptic or nearly orbicular, compressed, glabrous.

Ornamental.

FLS & FRS : Feb.–Mar.

MEDICAGO L.

Key to species

1. Plants usually cultivated, at times escaped; flowers light-purple or mauve; pods of 2–4 spirals but unarmed .. .. *M. sativa*
1. Plants wild; flowers yellow; pods unarmed and sickle shaped or if 2–4 spirals, armed :

2. Plants erect; pods armed .. .. .. *M. laciniata*
2. Plants diffuse or trailing; stipules laciniate or not; pods not armed :

3. Pods minute, sickle-shaped, 1-seeded, unarmed; stipules laciniate .. .. *M. lupulina*
3. Pods of 2–4 spirals, 4–8-seeded; stipules not laciniate.. .. .. *M. polymorpha*

Medicago laciniata All. Fl. Pedem. 1:316. 1785; FBI 2:90; C 1:326.

Annual, erect herbs, 20–30 cm tall. Leaves 3-foliolate, petiolate; leaflets 1–2.2×0.6–1 cm, obovate to elliptic-obovate, sharply inciso-crenate, sessile, glabrous. Flowers minute, in 0.8–1 cm long, compact, globose, axillary, pedunculate heads

A weed in cultivated fields in North Gujarat (Mansa); very rare.

FLS & FRS: Mar.

Medicago lupulina L. Sp. Pl. 779. 1753; FBI 2:90; C 1:326; Bailey 582; WI 6:312.

Annual, creeping or suberect herbs. Leaves 3-foliolate, petiolate; leaflets 0.6–1×0.3–0.8 cm, obovate or elliptic-obovate, inciso-crenate on margins. Flowers minute, in axillary, compact, spicate racemes.

Among grasses along margins of a pond in North Gujarat (Prantij); frequent.

FLS & FRS : Jan.–Feb.

Medicago polymorpha L. Sp. Pl. 779. 1753. *Medicago hispida* Gaertn. Fruct. 2:349. 1791; Bailey 582; WI 6:312. f. 106. *Medicago denticulata* Willd. Sp. Pl. 3:1414. 1802; FBI 2:90; C 1:327.

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Prostrate or suberect, glabrous or sparsely hairy, annual herbs. Leaves 3-foliolate, petiolate; leaflets 1–1.5 cm long, obovate, denticulate. Flowers yellow, few, in lax, umbellate heads on 0.5–1 cm long, wiry, glabrous peduncle.

Medicago sativa L. Sp. Pl. 778. 1753; FBI 2:90; C 1:327. Bailey 582; WI 5:313. f. 107; S & J 19.

An erect, almost glabrous, perennial herb, 30–90 cm tall. Leaves trifoliolate, petiolate 1.2–2×0.3–0.5 cm, obovate to oblanceolate, glabrous but for a few hairs on mid-nerve beneath, dentate in upper half. Racemes 1–3.5 cm long, compact, axillary and terminal. Fruits pale-brown, slightly pubescent.

Cultivated in many parts of Gujarat; also an escape along roads, railway lines and in river beds. (LACHKO).

FLS & FRS : Throughout the year.

MELILOTUS Adans.

1. Flowers yellow; pods usually 1-seeded .. .. .. *M. indica*
1. Flowers white; pods often 2-seeded .. .. *M. alba*

Melilotus alba Lam. Encycl. 4:63. 1789; FBI 2:89; Bailey 583; WI 6:328. t. 114.

Erect, glabrous herbs, 30–60 cm tall. Leaflets 1–2.6×0.5–1 cm, glabrous, oblanceolate or obovate, sharply toothed. Racemes 4–12 cm long, terminal, compact. Pods 0.2–0.4 cm long, turgid, glabrous. Seeds nearly globose, smooth, glabrous.

Throughout; not common. (JANGLI METHI)

FLS & FRS : Dec.–June

Melilotus indica All. Fl. Pedem. 1:308. 1785; C 1:325; Bailey 583; WI 6:329; Ch & O 78; S & J 19; S 54. *Melilotus parviflora* Desf. Fl. Atlant. 2:192. 1800; FBI 2:89.

Erect, almost glabrous herbs, 30–45 cm tall. Leaflets 0.4–2 ×0.2–0.7 cm, elliptic-obovate or oblanceolate, serrate, glabrous

or nearly so. Racemes 5–12 cm long, terminal. Pods 0.2–0.4 cm long, 1-seeded, ellipsoid-oblong, glabrous. Seed brown, compressed, smooth, glabrous.

Throughout, scattered or subgregarious; not common.

FLS & FRS : Sep.–Apr.

MILLETTIA W. & A.

Key to species

1. Standard auriculate; stamens monadelphous; pods flattened, velvety, very tardily dehiscent .. .. *M. auriculata*
1. Standard not auriculate; stamens diadelphous; pods glabrous, torulose, dehiscent .. .. *M. racemosa*

Millettia auriculata Baker ex Brandis, For. Fl. 133. 1874; FBI 2:108; Chavan & Bedi in Journ. Bombay nat. Hist. Soc. 63:779. Pl. 2. 1966. *Robinia macrophylla* Roxb. Fl. Ind. 3:329. 1832 (non *M. macrophylla* Bth.). *Millettia extensa* Bth. ex Baker in Hk. f. FBI 2:109. 1876; WI 6:378.

A large, woody climber. Leaflets 7 or 9, 10–25×5–12 cm, glabrescent. Flowers yellow, in racemes at ends of axillary branches. Pod 8–20×2–2.5 cm. Seeds dark-brown, rounded and compressed.

Central Gujarat (Ratan mahals in Panchmahals and Kawant range in Chhotaudepur forest division); rare.

FLS : July–Sep. *FRS* : Oct.–Mar.

Millettia racemosa Bth. Pl. Jungh. 249. 1851–1855; FBI 2:105; C 1:343. *Wisteria pallida* Dalz. & Gibs. Bombay Fl. 61. 1861. *Millettia pallida* (Dalz. & Gibs.) Dalz. in Journ. Linn. Soc. 13:187. 1873.

An extensive, deciduous, woody climber, with rough, bluish-black bark. Leaves 20–30 cm long; leaflets 13 or 15, opposite, 5–14.5×2.1–4.4 cm, oblong or obovate-oblong, membranous or

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subcoriaceous, glabrous. Flowers white, in 10-22 cm long, compact racemes at ends of axillary and terminal peduncle. Pods 10-16 cm long. Seeds 2-5, ovoid, glabrous, smooth.

In deciduous forests of Dangs, Vyara, Rajpipla and Chhotaudepur; rare. (VELBIVIA)

FLS & FRS : Mar.-May

MOGHANIA St. Hil. ex Desv.

Key to species

1. Leaves 1-foliolate; bracts persistent, foliaceous, folded, concealing flowers.. .. .. *M. strobilifera*
1. Leaves 3-foliolate; bracts not as above :
   2. Flowers in congested panicled racemes.. .. *M. lineata*
   2. Flowers in dense subspicate racemes :
      3. Leaflets nearly twice as long as broad.. *M. macrophylla*
      3. Leaflets nearly thrice as long as broad. *M. praecox* var. *robusta*

Moghania lineata (L.) O. Ktze. Rev. Gen. Pl. 199. 1891; Mukerjee in Bull. Bot. Soc. Bengal 6:15. 1953. *Hedysarum lineatum* L. Sp. Pl. 1054. 1753. *Flemingia lineata* Roxb. Hort. Beng. 56. 1814 (nomen) & Fl. Ind. 3:341. 1832; FBI 2:228; C 1:417.

45-90 cm tall, bushy shrubs; bark pale-to dark-brown, densly appressed-pubescent in younger parts. Leaflets 1.6-4 × 0.6-1.5 cm, obovate-lanceolate or elliptic-lanceolate, appressed-silky-pubescent, plicate above, minutely gland-dotted beneath. Flowers bluish-purple, axillary. Pods 0.6-1 cm long, ellipsoid-oblong, glandular-pubescent. Seeds 2, 0.3 × 0.2 cm, orbicular-oblong, smooth, glabrous.

Bulsar, Broach and Panchmahals; rare.

FLS & FRS : Dec.-Feb.

Moghania macrophylla (Willd.) O. Ktze. Rev. Gen. Pl. 199. 1891; Mukerjee 16. Santapau & Shah in Journ. Bombay nat. Hist. Soc. 62:203. 1965. *Crotalaria macrophylla* Willd. Sp. Pl. 3:982. 1802. *Flemingia congesta* Roxb. Hort. Beng. 56. 1814 (nomen) & Fl. Ind. 3:340. 1832; FBI 2:228 p.p.; C 1:418; WI 4:46. f. 28.

An erect, woody shrub, 1.5 m tall with silky pubescent, slender, triangular branches. Leaflets 6.7-13 × 2.3-5.5 cm, lanceolate or oblanceolate, pubescent, gland-dotted beneath. Pods 1-1.2 cm long, 2-seeded, tomentose.

Dangs-Waghai; very rare.

FLS & FRS : Feb.

Moghania praecox (Cl. ex Prain) H.L.Li var. **robusta** Mukerjee in Bull. bot. Soc. Bengal 6:19. 1953; Santapau & Shah in Journ. Bombay nat. Hist. Soc. 62:203. 1965.

120-180 cm tall, glabrous shrubs. Leaves 3-foliolate; petiolate; leaflets 12.5-20 × 3.5-6 cm, lanceolate, glabrous but for hairy nerves beneath. Racemes axillary, 2.2-5 cm long.

Dangs, in hedges along railway lines and on edges of cleared forests.

Moghania strobilifera (L.) St. Hil. ex Jackson in Index Kew. 252. 1895; Ch & O 88; S & J 19; S 73. *Hedysarum strobiliferum* L. Sp. Pl. 1053. 1753. *Flemingia strobilifera* (L.) R. Br. ex Ait. Hort. Kew (ed.2) 4:350. 1812; FBI 2:227; C 1:416; WI 4:46. f. 28.

1-2.5 m tall shrubs, fulvous or grey-pubescent in younger parts. Leaves 1-foliolate, petiolate; leaflets 5-16.5 × 2.3-7.5 cm, ovate-lanceolate, glabrous but for sparsely hairy nerves, rounded at base. Flowers in 7-16 cm long, axillary and terminal racemes. Pods 0.5-0.7 cm long, oblong, pubescent, mucronate. Seeds 1-2, dark-brown or nearly black, smooth.

In forest undergrowth; common, gregarious.

FLS : Nov.-Jan. *FRS* : Dec.-Feb.

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MUCUNA Adans. nom. cons.

Mucuna prurita Hk. f. in Bot. Misc. 2:348. 1830–31; WI 6:442; Ch & O 85; S & J 19; S 64. *Mucuna pruriens* Baker in Hk. f. FBI 2:187. 1876; C 1:389.

Extensive, lignose, hairy twiner. Leaves 3-foliolate, petiolate; leaflets 4–16×2–14 cm, appressedly silky-hairy, ovate-triangular, ovate-lanceolate or ovate-rhomboid. Flowers 2.5–3.5 cm long, in 5–30 cm long racemes. Pods 4.5–8×0.6–1.2 cm, 4–6-seeded, sandy-brown, densely bristly. Seeds 1.1×0.8 cm, elliptic, compressed, dark-brown, spotted black, smooth, glabrous.

Throughout; common. (KAVACH, KOYLI).
FLS : Sep.–Nov. *FRS :* Oct.–Dec.

OUGEINIA Bth.

Ougeinia oojeinensis (Roxb.) Hochreut. in Bull. Soc. Bot. Geneve 13–14:51. 1909. *Dalbergia oojeinensis* Roxb. Hort. Beng. 53. 1814 (nomen) & Fl. Ind. 3:220. 1832. *Ougeinia dalbergioides* Bth. Pl. Jungh. 216. 1851–1855; FBI 2:161; C 1:373.

A deciduous tree, 9–16 m tall, with black or dark-brown bark. Leaflets 6.6–18×4.5–15 cm, coriaceous, glabrous, broadly ovate or suborbicular. Flowers numerous, in fascicled racemes. Pods 4–6×0.6–1.2 cm, flat, reticulately veined.

In deciduous forest; not common. (TANACH)
FLS & FRS : Feb.–Apr.

PHASEOLUS L.

Phaseolus vulgaris L. Sp. Pl. 723. 1753; FBI 2:200; Bailey 574; WI 8:8. f. 7.

Annuals. Leaflets 2–7.2×1.7–6.5 cm, broadly ovate to rhomboid-ovate, glabrescent. Flowers 2–3-fascicled at a node, in 15–30 cm long, terminal, lax racemes. Pods 2–9.5×0.2–0.6 cm, flat, pubescent. Seeds 1–1.5 cm long, globose to oblong, white, brown, violet-purple or variously mottled.

Cultivated. (FANSI)
FLS & FRS : Nov.–Dec.

PISUM L.

Pisum sativum L. Sp. Pl. 727. 1753; FBI 2:181; C 1:436; Bailey 553; WI 8:124. ff. 44–46.

Twining, glabrous annuals. Leaflets 7–11, 0.8–3×0.6–1.8 cm, ovate-elliptic, sessile. Flowers white, few, in axillary racemes. Pods 3.5–6 cm long, turgid, linear-oblong, acuminate. Seeds nearly globose, bright-green to greenish-white, smooth, glabrous.

Cultivated; also an escape. (VATANA)
FLS & FRS : Dec.–Apr.

PSEUDARTHRIA W. & A.

Pseudarthria viscida W & A. Prodr. 209. 1834; FBI 1:154; C 1:366; S & J 19; WI 8:283

Prostrate or suberect, hairy herbs. Leaves 3-foliolate, petiolate; leaflets 2.2–4.8×1.5–3.7 cm, ovate, ovate-oblong or ovate-rhomboid, appressed-hairy, ciliate on margins. Flowers purple, violet or rose-coloured, in terminal and axillary racemes. Pods 0.8–2.2×0.5–0.8 cm, linear-oblong, minutely beaked, viscidly-hairy. Seeds 2–6, subreniform, compressed, dark-brown or slightly black.

Kutch and Saurashtra; not common. (CHAPAKNOVELO)
FLS & FRS : Sep.–Oct.

PSORALEA L.

Key to species

1. Leaves simple; flowers bluish-purple; corolla almost twice as long as calyx; pods not enclosed in persistent calyx; pedicels straight; stem and branches nigro-punctate .. .. *P. corylifolia*

1. Leaves compound; flowers yellow; corolla slightly exserted from calyx; pods enclosed in persistent calyx; stem and branches not nigro-punctate .. .. .. *P. plicata*

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Psoralea corylifolia L. Sp. Pl. 764. 1753; FBI 2:103; C 1:341; Ch & O 87; S & J 19; S 55. WI 8:296. ff. 106-107.

Erect herbs, 15-90 cm tall, pubescent, often nigro-punctate. Leaves 1.3-11.3×1-8.8 cm, broadly ovate-elliptic to almost orbicular, incise-dentate, pubescent. Flowers axillary, solitary, or few in 2-5 cm long, dense racemes. Pods 0.4-0.5 cm long, ovoid-oblong, somewhat compressed, glabrous, blackish. Seeds 0.2-0.3 cm across, glabrous, smooth, black.

Throughout, along road sides and railway lines, but not common. (BAVACHI; BABCHI, GAWAR)

FLS & FRS: Aug.-Mar.

Psoralea plicata Del. Fl. Egypt. 252. t. 37. f. 3. 1813; FBI 2: 103; C 1:342; WI 8:298.

30-50 cm tall, almost glabrous herbs. Leaflets 1.2-2.6 × 0.2-0.8 cm, oblanceolate, sinuate or subserrate, appressed-hairy, gland-dotted beneath. Flowers solitary or in fascicles of 2-3, in 2.5-9.2 cm long, terminal and axillary racemes. Pods 0.4-0.6 cm long, reflexed, ellipsoidal, hairy.

Kutch; not common. (KAPURIO, DHOLI BAVACHI).

FLS & FRS: Aug.-Oct.

PTEROCARPUS N. J. Jacq. nom. cons.

Pterocarpus marsupium Roxb. var. *acuminatus* Prain in Journ. As. Soc. Beng. 56:455. 1895; C 1:427.

12-18 m tall, deciduous trees, with ash-coloured or yellowish-grey, longitudinally fissured bark. Leaves 15-25 cm long; leaflets 5-9, 5-11.5×4.2-7 cm, ovate to ovate-oblong or ovate-lanceolate, glabrous. Panicles 8-30 cm long, terminal and axillary. Pods 3-5.2 cm in diameter, glabrous.

In deciduous forests; rare. (BIYO)

FLS: Apr.-May *FRS*: May-Oct.

PUERARIA DC.

(Key adapted from *Flora Assam* 2:79)

1. Flowers bluish-purple, appearing before leaves; pods constricted between seeds .. .. *P. tuberosa*

1. Flowers red or reddish tipped, appearing with leaves; pods not constricted between seeds. .. .. *P. lobata*

Pueraria lobata (Willd.) Ohwi in Bull. Tokyo Sci. Mus. no. 18:16. 1947; Verdcourt in Taxon 17:170-173. 1968: WI 8:313; *Dolichos triloba* L. Sp. Pl. 726. 1753 (p. p.). *Pueraria thunbergiana* Bth. in Journ. Linn. Soc. Bot. 9:122. 1865: S & J 19.

Listed by Santapau (1962) from Saurashtra.

Pueraria tuberosa (Roxb.) DC. Prodr. 2:240. 1825; FBI 2:197; C 1:399; S & J 19; WI 8:316. f. 118.

Extensive twiner, silky-grey-pubescent. Leaflets 7.8-24×6-18.5 cm, broadly ovate, appressed-hairy. Flowers bluish-purple, in 20-60 cm long panicles, terminal or from axils of fallen leaves. Pods 1.5-8×0.7-1 cm, 1-6-jointed, brownish-tomentose. Seeds reddish-brown, elliptic-oblong, glabrous, smooth.

RHYNCHOSIA Lour. nom. cons.

Key to species and varieties

1. Leaflets upto 5.5 cm long :

   2. Plants usually trailing; pods almost orbicular; seeds with a waxy strophiole, flowers in capitate racemes .. *R. aurea*

   2. Plants usually twining; pods elliptic-lanceolate; seeds estrophiolate; flowers distant on racemes :

      3. Woody; leaflets coriaceous, downy on both surfaces; pods 2.5-3.5 cm long .. .. .. *R. bracteata*

      3. Herbaceous; leaflets membranous, glabrous above, pubescent on veins beneath; pods 1-1.5 cm long :

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4. Leaflets obtuse or subacute at apex.. .. .. *R. minima* var. *minima*

4. Leaflets acute or acuminate at apex.. .. .. *R. minima* var. *laxiflora*

1. Leaflets more than 5.5 cm long :

5. Corolla purple; hairs not glandular; pods downy-villous .. .. *R. rothii*

5. Coralla yellow; hairs glandular; pods sparsely pubescent .. .. *R. viscosa*

Rhynchosia aurea DC. Prodr. 2:386. 1825; FBI 2:221 (p.p.); C 1: 413.

Patently hairy herbs; hairs brown or white. Leaflets 1.4-4.2 ×1.8-4.6 cm, subsessile, ovate, obovate or ovate-rhomboid, sparsely hairy, Flowers yellow or reddish-yellow, axillary. Pods 0.8-1.7×0.4-0.9 cm, subcompressed, greenish-brown to dark -brown, finely pubescent. Seeds 2, oblong, dark-brown, glabrous, smooth; strophiole white to pale-brown.

Kutch to Rajpipla, among grasses; not common.

FLS & FRS : Aug.-Dec.

Rhynchosia bracteata Bth. Mss. ex Baker in Hk. f. FBI 2:225. 1876; C 1:415.

A stout, climber. Leaflets 3-5.2 cm long and almost as much broad, terminal rhomboid-orbicular, laterals obliquely ovate, all downy. Flowers reddish-yellow, in 6-15 cm long racemes. Pods 2.5-3.5×0.8-1.2 cm, flat, slightly recurved, thinly pubescent. Seeds dark-brown, nigro-punctate.

Bulsar, Dangs, Rajpipla, Panchmahals, on hedges or in forests; rare.

FLS & FRS : Oct.-Feb.

Rhynchosia minima (L.) DC. var. **minima**. *Rhynchosia minima* (L.) DC. Prodr. 2:385. 1825; FBI 2:223; C 1:414; Ch & O 87; S & J 19. *Dolichos minimus* L. Sp. Pl. 1020. 1753.

Trailing or twining, glabrous or hairy herbs. Leaflets 1.5-4.5×0.4-2.2 cm, broadly ovate-rhomboid or nearly orbicular, glabrous or nearly so. Flowers reddish-yellow, in 5-12 cm long, axillary, lax racemes. Pods 1-1.5×0.4-0.6 cm, obliquely oblong, pubescent, compressed, 2(-1)-seeded. Seeds globose, dark-brown, somewhat compressed, estrophiolate.

Throughout; common; on hedges (NAHNIKAMALVEL).

FLS & FRS : Aug.-Apr.

Rhynchosia minima (L.) DC. var. **laxiflora** (Camb.) Baker in Hk. f. FBI 2:223. 1876; C 1:414; S & J 19. *Rhynchosia laxiflora* Camb. in Jacq. Voy. Bot. 44. t. 540. 1844.

Trailing herbs. Leaflets 2.5-5.4×1-2.6 cm, lanceolate-rhomboid, glabrous or nearly so. Flowers and fruits as in var. *minima*.

Kutch, Saurashtra, Chhotaudepur forest division, on hedges; rare. (DARIAVEL)

FLS & FRS: Aug.-Apr.

Rhynchosia rothii Bth, ex Aitch. Cat. Pl. Punjab & Sind 50 1869; S & J 19. *Dolichos tomentosus* Roth, Nov. Pl. Sp. 345. 1821. *Rhynchosia tomentosa* Kurz in Journ. As. Soc. Bengal 43: 186. 1874 (non Hk. f. & Arn. 1835). *Rhynchosia sericea* Span. in Linnaea 15:195. 1841 (non Gill. ex Hk. f. & Arn. 1833); FBI 2:225.

An extensive, pubescent, woody twiner. Leaflets 6-10.5× 3-8 cm, pubescent, terminal one rhomboid-ovate and equal sided, lateral ones obliquely ovate to ovate-triangular. Flowers dark-purple, in 4-10 cm long, axillary racemes. Pods 2-3×0.6-0.8 cm, oblanceolate, falcate, long apiculate. Seeds elliptic-oblong, black, glabrous, mottled.

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Dangs, Songadh and Saurashtra, in forest and on hedges; rare. (FAGIO, MAKHMALI-FAGIYO).

FLS & FRS : Aug.-Oct.

Rhynchosia viscosa DC. Prodr. 2:387. 1825; FBI 2:225 S & J 19.

Reported from Kutch and Saurashtra by Thaker J. I. (1910, 1926). Santapau (1962) included it in his *Flora of Saurashtra* on the authority of Thaker J. I.

ROTHIA Pers. nom. cons.

Rothia indica (L.) Druce in Rep. Bot. Exch. Cl. Brit. Isles 3:423. 1914; WI 9:80. f. 23. *Trigonella indica* L. Sp. Pl. 778. 1753. *Rothia trifoliata* Pers. Syn. Pl. 2:302. 1807; FBI 2:63; C 1:308.

Diffuse annuals. Leaflets 1.2–3.5×0.4-0.6 cm, elliptic-oblong, or obovate-oblong, appressed-hairy. Flowers creamy-white, axillary, solitary or geminate. Pods 4.5–7 cm long, narrowly linear, apiculate, silky-hairy. Seeds yellowish-brown, reniform, glabrous, smooth.

Rajpipla forest division; very rare; collected by Dr. A. I. Patel (1972).

FLS & FRS : Aug.

SESBANIA Scop. nom. cons.

1. Trees or shrubs :
   2. Corolla 6–8 cm long, creamy-white or tinged pinkish; pods 16–30 cm long, subtetragonous .. *S. grandiflora*
   2. Corolla 3–3.5 cm long, red; pods 20–30 cm long, quadrangular .. .. *S. javanica*
   2. Corolla upto 2 cm long, yellow, vexillum either spotted purple or completely maroon or dark-purple outside; pods not more than 15 cm long terete, subterete, at times torulose :

   3. Corolla spotted purple .. *S. sesban subsp. sesban* var. *sesban*
   3. Corolla completely maroon or dark-purple but not spotted .. .. *S. sesban subsp. sesban* var *bicolor*

1. Herbs or undershrubs :
   4. Corolla pure yellow; stem unarmed .. *S. cannabina*
   4. Corolla yellow, spotted purple on vexillum outside; stem armed .. .. *S. bispinosa*

Sesbania bispinosa (Jacq.) W. F. Wight in U. S. Dept. Agr. Bur. Pl. Ind. Bull. 137:15. 1909; S & J 19; S 56. *Aeschynomene bispinosa* Jacq. Icon. Pl. Rar. 3:t. 564. 1773. *Coronilla aculeata* Willd. Sp. Pl. 3:1147. 1803. *Sesbania aculeata* (Willd.) Pers. Syn. Pl. 2:316. 1807; FBI 2:114; C 1:350 (non *Aeschynomene aculeata* Schreb. 1770).

1–2 m tall, simple or branched, minutely prickly undershrubs. Leaves 5–12.5 cm long, abruptly pinnate; leaflets 10–20 pairs, 0.6–2×0.2–0.3 cm, sessile, linear-oblong or elliptic-oblong, glabrous. Flowers 0.8–1.3 cm long, few, in 2–3.5 cm long, axillary and terminal racemes. Pods 6–30 cm long, falcate, drooping, torulose, glabrous, shortly beaked. Seeds ±0.3 cm long oblong, smooth, greenish-brown.

Throughout, a weed in cultivated fields and moist places; common. (IKAD)

FLS & FRS : Aug.-Feb.

Sesbania cannabina (Retz.) Pers. Syn. Pl. 2:316. 1807; Gillett in Kew Bull. 17:130. 1963; WI 9:293. *Aeschynomene cannabina* Retz. Obs. Fasc. 5:26. 1789. *Sesbania aculeata* Pers. var. *cannabina* (Retz.) Baker in Hk. f. FBI 2:115. 1876. *Sesbania bispinosa* W. F. Wight var. *cannabina* Santapau, Pl. Saurashtra 14: 1953; S & J 19.

Similar to *S. bispinosa* W. F. Wight but differs in having unarmed stem and pure yellow petals; not common. (LISIKAD)

FLS & FRS : Dec.-Jan.

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Sesbania grandiflora (L.) Pers. Syn. Pl. 2:316. 1807; FBI 2:115; C 1:350; S & J 20; WI 9:295. ff. 94-95. *Robinia grandiflora* L. Sp. Pl. 722. 1753. *Agati grandiflora* (L.) Desv. in Journ. Bot. 1:120. 1813; Bailey 557.

A soft-wooded tree. 8–10 m tall. Leaves 15–30 cm long; leaflets 1.7–3.5×0.7–1.8 cm, oblong or slightly obovate, subsessile, glabrous. Flowers showy, in short, axillary racemes. Pods woody, linear, somewhat torulose, pendent, beaked. Seeds 17–20, oblong-ellipsoid, brown, flat, smooth.

Planted. (AGATHIO)

FLS & FRS : Nov.–Feb.

Sesbania **javanica** Miq. Fl. Ind. Bot. i. 1:288. 1855.

4–6 m tall trees, with light-brown bark. Leaves 14–30 cm long; leaflets subopposite, subsessile, 0.5–3.2×0.2–0.8 cm, linear-oblong, densely appressed-hairy. Flowers showy, in 10–12 cm long, axillary racemes. Pods thickened on angles, shortly beaked. Seeds subquadrate, glabrous, shining.

Native of Java; found at Dangs in a cultivated field.

FLS & FRS : Jan.–Feb.

Sesbania sesban (L.) Merr. subsp. **sesban** var. **bicolor** (W. & A.) F. W. Andrews, Pl. Anglo-Egypt. Sudan 2:232. 1952. *Sesbania aegyptiaca* Poir. var *bicolor* W. & A. Prodr. 24. 1834; C 1:350.

This variety differs from var. *sesban* by the vexillum being maroon or deep purple outside.

Sparingly planted.

FLS & FRS : Jan.–Mar.

Sesbania sesban (L.) Merr. subsp. **sesban** var. **sesban**; Gillet in Kew Bull. 17:112. 1963. *Sesbania aegyptiaca* Poir. var. *picta* Prain in Journ. As. Soc. Beng. 66:367. 1898; C 1:349.

Sesbania sesban (L.) Merr. var. *picta* Santapau, Pl. Saurashtra 14. 1953; S & J 20.

An unarmed, large shrub or small tree. Leaves 3–10 cm long; leaflets 0.4–1.5×0.2–0.4 cm, pale-green, linear-oblong, glabrous or nearly so. Flowers 1–1.8 cm long, in 6–10 cm long, slender, axillary, pendulous racemes. Pods 10–17.6 cm long, linear-cylindric, pendulous, torulose, beaked. Seeds oblong, greenish-brown, smooth, glabrous, polished.

Planted as a hedge or self-sown. (SHEVARI; JAYANTI)

FLS & FRS : Oct.–Mar.

SMITHIA Ait. nom. cons.

Key to species

1. Stem not bristly :
   2. Plants erect; leaflets 2–4 pairs, oblanceolate-oblong; lower lip of calyx entire; calyx reticulately veined; pods 10–15-jointed .. .. *S. salsuginea*
   2. Plants diffuse; leaflets 2–13 pairs, linear-oblong; lower lip of calyx not entire; pods 3–6-jointed; calyx parallel veined:
      3. Flowers 1 or 2, in axils of leaves, crowded at ends of branches.. .. .. *S. conferta*
      3. Flowers in short racemes :
         4. 20–40 cm tall herbs; flowers 0.7–0.9 cm long.. .. .. *S. sensitiva* var. *sensitiva*
         4. 50–100 cm tall herbs; flowers 1–1.3 cm long .. .. *S. sensitiva* var. *flava*
1. Stem with deflexed bristles :
   5. Plants diffuse; leaflets 2 pairs; racemes few-flowered; calyx dichotomously veined; vexillum orange-yellow with scarlet streaks; pods 6–8-jointed, joints tuberculate.. .. .. *S. bigemina*
   5. Plants erect; leaflets 3–8 pairs; flowers in robust, dichotomous, thyrsoid racemes, pure yellow; calyx parallel-veined; pods 10–12-jointed, joints not tubercled.. .. *S. setulosa*

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Smithia bigemina Dalz. in Kew Journ. Bot. 3:208. 1851; FBI 2:149; C 1:360; S 59; WI 9:369.

Slender herbs, with yellowish-brown hairs. Leaves abruptly pinnate; leaflets 0.8–1.6×0.3–0.6 cm, subsessile, oblanceolate, strigosely hairy beneath. Seeds yellowish-brown, suborbicular, glabrous, smooth.

Dangs (Saputara); not common.

FLS & FRS : Sep.

Smithia conferta Sm. in Rees, Cyclop. 33:2. 1819; C 1:358. S & J 20; S 58; WI 9:368. *Smithia geminiflora* Roth var. *conferta* Baker in Hk. f. FBI 2:149. 1876.

Annual herbs. Leaves 1–2.8 cm long; leaflets 2–8-paired, 0.5–1.1×0.2–0.3 cm, subsessile, bristly on margins and mid-vein beneath. Flowers yellow, solitary or geminate, in upper axils. Pods 3–6-jointed. Seeds polished, dark-black.

South Gujarat (Bulsar, Dangs, Vyara, Rajpipla), North Gujarat (Khedbrahma) and Saurashtra, among grasses; common.

FLS & FRS : Aug.–Oct.

Smithia salsuginea Hance, Journ. Bot. 7:164. 1869; C 1:362. *Smithia dichotoma* Dalz. MS ex Baker in Hk. f. FBI 2:150. 1876.

Annual herbs. Leaves abruptly pinnate; leaflets 0.5–1.2× 0.3–0.5 cm, glabrous but for sparsely ciliate margins. Flowers yellow in lax, terminal racemes. Pods 0.6–0.9 cm long; joints orbicular, yellowish-brown, glabrous. Seeds yellow, elliptic, glabrous, smooth.

Dangs and Vansada in South Gujarat; rare.

FLS & FRS : July–Sep.

Smithia sensitiva Ait. var. **flava** (Dalz.) Cooke, Fl. Pres. Bombay 1:336. 1902 & 1:358. 1958 (reprinted); S 58. *Smithia flava* Dalz. MSS. ex Prain in Journ. As. Soc. Beng. 66:378. 1898.

Robust herbs. Leaflets 3–13 pairs, 0.5–1.2×0.2–0.3 cm, sparsely bristly on mid-vein beneath and margins. Flowers yellow, few, in axillary racemes. Pods as in var. *sensitiva*.

Dangs (Ahwa and Subir), among grasses; common.

FLS & FRS : Oct.–Nov.

Smithia sensitiva Ait. var. **sensitiva**. *Smithia sensitiva* Ait. Hort. Kew. 3:496. 1789; FBI 2:148; C 1:357; WI 9:368.

Slender herbs. Leaves abruptly pinnate; leaflets 3–10 pairs, 0.3–1.2×0.2–0.4 cm, glabrous or sparsely bristly on margins and mid-veins beneath. Flowers yellow, few, in axillary racemes. Pods 0.6–0.7 cm long, 3–6-jointed; joints orbicular, glabrous, smooth, reddish-brown.

Bulsar, Dangs, Chhotaudepur and Saurashtra, among grasses; frequent.

FLS & FRS : Sep.–Dec.

Smithia setulosa Dalz. in Kew Journ. Bot. 3:208. 1851; FBI 2:149; C 1:359; S 59; WI 9:369.

Strigosely hairy, stout herbs. Leaves 3–9 cm long; leaflets 0.8–3×0.2–0.7 cm, linear-oblong, bristly on margins and mid-rib beneath. Flowers bright-yellow, in 3–6.5 cm long, racemes. Pods 0.5–0.6 cm long; joints orbicular, glabrous.

Dangs (Saputara) in undergrowth on hilly slopes; occasional.

FLS & FRS : Sep.–Oct.

TAVERNIERA DC.

Tavernicra cuneifolia (Roth) Arn. in Nov. Act. Nat. Cur. 18(1) : 332. 1836; S & J 20. *Hedysarum cuneifolium* Roth, Nov. Pl. Sp. 357. 1821. *Taverniera nummularia* Baker in Hk. f. FBI 2:140. 1876 non DC. 1825; C 1:353.

Much-branched undershrubs, velvety-canescent. Leaves 0.4–1.3×0.3–0.9 cm, obovate, appressed-pubescent. Flowers few,

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reddish, in shrot, axillary, lax racemes. Pods 0.5–0.7 cm long, 1-2-jointed, compressed. Seeds yellowish-brown, elliptic or subreniform, glabrous, smooth.

Kutch and Saurashtra (frequent), and North Gujarat (Kharaghoda, rare). (JETHIMADH, JETHIMAL)

FLS & FRS : Aug.–Oct.

TEPHROSIA Pers. nom. cons.

Key to species

1. Flowers white .. .. *T. candida*
1. Flowers not white :
   2. Leaves simple :
      3. Corolla blue to bluish-purple; pods 0.2–0.3 cm broad, slightly pubescent; branches slender; pedicels 0.4–1 cm long, filiform, hairy .. .. *T. strigosa*
      3. Corolla bright-purple; pods 0.4–0.7 cm broad, densely-pubescent; branches stout; pedicel 0.2–0.3 cm long, somewhat stout, pubescent .. .. .. *T. jamnagarensis*
   2. Leaves compound; long :
      4. Pods villous :
         5. Flowers bright-purple, in 4–10 cm long. spiciform racemes .. .. *T. villosa*
         5. Flowers creamy, in 12–20 cm long, lax racemes .. .. *T. collina* var. *lanuginocarpa*
      4. Pods pilose or glabrescent but villous :
         6. Flowers in elongated racemes :
            7. Racemes axillary; style bearded .... *T. tinctoria*
            7. Racemes extra-axillary; style not bearded :
               8. Leaflets 9–15 :
                  9. Plants erect or suberect; racemes many-flowered :

                  10. Erect, bushy, densely sericeous; stem and branches zigzag, angled, hairy; flowers more than 0.8 cm long .. .. *T. hamiltonii*
                  10. Suberect, sparsely hairy or nearly glabrous atleast in older parts; branches not zigzag, terete .... *T. purpurea*
               9. Plants procumbent; racemes 1–3-flowered .. .. *T. pumila*
               8. Leaflets 5–7 .. .. .. *T. appollinea*
         6. Flowers 1–2, in leaf axils :
            11. Pods much recurved .. .. .. *T. senticosa*
            11. Pods straight :
               12. Flowers geminate in leaf axils .. .. *T. pauciflora*
               12. Flowers solitary in leaf axils.. .. *T. uniflora* var. *petrosa*

Tephrosia apollinea Link, Enum. Hort. Berol. 2:252. 1822; C 1:347.

Diffuse, suffruticose, appressed-pubescent herbs. Leaves 6.5–8 cm, long, alternate; leaflets 5–7(–11), 0.7–3.5 × 0.2–0.6 cm, oblong or oblanceolate, densely silky hairy beneath. Flowers 0.4-0.5 cm long, purple, in 7–17 cm long, leaf-opposed, terminal and axillary racemes. Pods 4.3–5 cm long, curved upwards, flat, mucronate, thinly appressed-hairy, 6–9-seeded.

Occasional in shaded spots in Kutch.

FLS & FRS : Aug.

Tephrosia candida DC. Prodr. 2:240. 1825; FBI 2:111; S & J 20.

According to Santapau (1962) this species is a native of Himalayas and he cites authority of Thaker J. I (1910) who reported it wild on the Barda hills. Flowers white.

FLS & FRS : Monsoon.

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Tephrosia collina Sharma var. **lanuginocarpa** Sharma in Journ. Bombay nat. Hist. Soc. 60 (3) : 757–758. 1960.

Diffuse, hairy annuals, 30–60 cm tall. Leaves 5–7 cm long; leaflets 11–13, opposite, 1–3.8×0.2–1 cm, elliptic-oblong or oblong-lanceolate, glabrous above, appressed-pubescent beneath. Flowers cream-coloured, in lax racemes. Pods 2.6–7.5×0.3–0.7 cm, compressed, 7–11-seeded, straight or slightly falcate, shortly beaked, margins densely, patently ciliate. Seeds oblong, compressed, glabrous, brownish.

Rajpipla, among grasses; rare.

FLS & FRS : Aug.–Nov.

Tephrosia hamiltonii Drumm. in Gamble Fl. Pres. Madras 1:320. 1918; Ch & O 81; S & J 20.

Undershrubs, 30–70 cm tall, with, spreading, appressed-hairy branches. Leaves 2–12 cm long; leaflet 9–15, opposite, 1–2.3×0.5–1.8 cm, obovate to oblanceolate, appressed-hairy beneath. Flowers bright-purple, in 5–15 cm long, leaf-opposed, lax racemes. Pods 2.5–4.5×0.3–0.4 cm, linear, flat, somewhat torulose, glabrescent or nearly so. Seeds dark-brown, mottled grey, ellipsoid-oblong, smooth.

Rajpipla, Pavgadh, Chhotaudepur, North Gujarat and Saurashtra; common and subgregarious in areas of occurrence.

FLS & FRS : Aug.–Feb.

Tephrosia jamnagarensis Santapau in Proc. nat. Inst. Sci. India 24B:133. f. 1. 1958; S & J 20.

Erect or suberect, appressedly white hairy herbs. Leaves 1.4–6.2×0.3–0.8 cm, linear, linear-lanceolate, densely appressed-hairy beneath. Flowers solitary or geminate, in axils of leaves. Pods 1–2.3×0.4–0.7 cm, compressed. Seeds 5–6, reniform, brownish, glabrous, smooth.

Saurashtra and Broach, in the later locality rare; in cultivated fields.

FLS & FRS : Sep.–Oct.

Tephrosia pauciflora Grah. in Wall. Cat. 5635 1828 (nomen) ex Baker in Hk. f. FBI 2:114. 1876; C 1:348.

Prostrate herbs, with 10–35 cm long, appressed-pubescent branches. Leaves 1.8–3.5 cm long, alternate; leaflets 5–9, 0.5–1.2×0.2–0.6 cm, obovate to oblanceolate, pubescent, sessile. Flowers bright-purple. Pods 1.8–4.2×0.3–0.4 cm, linear, compressed, appressed-pubescent, with a recurved mucro. Seeds 8–10, 0.2×0.15 cm, subquadrate, obtuse, truncate at ends, brown, smooth.

Rare, among grasses.

FLS & FRS : Sep.–Nov.

Tephrosia pumila (Lam.) Pers. Syn. Pl. 2:330. 1807; S & J 20. *Galega pumila* Lam. Encycl. 2:599. 1788. *Tephrosia purpurea* (L.) Pers. var. *pumila* (Lam.) Baker in Hk. f. FBI 2:113. 1876; C 1:347.

Perennial herbs or undershrubs, hairy. Leaves 1–4 cm long; leaflets 9–13, 0.5–2.3×0.3–0.6 cm, obovate-oblong or oblanceolate, appressed-hairy. Flowers 0.5–0.8 cm long, bright-rosy-purple. Pods 2–3 cm long, linear, appressed-hairy. Seeds blackish-brown, oblong somewhat compressed.

Throughout, in plains; not common.

FLS & FRS : Sep.–Feb.

Tephrosia purpurea (L.) Pers. Syn. Pl. 2:329. 1807; FBI 2:112; C 1:346; S & J 20. *Cracca purpurea* L. Sp. Pl. 752. 1753.

30–80 cm tall undershrubs. Leaves 3–8 cm long; leaflets 9–13, 0.5–2.3×0.2–1.2 cm, obovate to oblanceolate, appressed-silky-hairy beneath. Flowers bright-rosy-purple or violet, in 5–16 cm long racemes. Pods 1.5–4.8 cm long, flat, linear, striaght or slightly curved, at length glabrous. Seeds 4–7, blackish-brown, oblong, somewhat compressed, smooth, glabrous.

Throughout, common. (SARPANKHO)

FLS & FRS : Throughout.

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Tephrosia senticosa (L.) Pers. Syn. Pl. 2:330. 1807; FBI 1:112; C 1:348; Ch & O 81; S & J 20. *Galega senticosa* L. Amoen. Acad. 3:19. 1756 & Sp. Pl. 1063. 1962.

Argento-canescent shrubs or undershrubs. Leaves 4–7 cm long, alternate; leaflets 0.5–3.2 × 0.1–0.5 cm, agrento-canescent beneath, oblanceolate. Pods 2.3–3.7 cm long, linear, flattened, persistently densely silky-pubescent. Seeds ellipsoid-oblong, smooth, glabrous.

Kutch and Saurashtra; frequent among grassess.

FLS & FRS : Aug.–Oct.

Tephrosia strigosa (Dalz.) Sant. & Mahesh. in Journ. Bombay nat. Hist. Soc. 54:804. 1957; Ch & O 80; S & J 20. *Macronyx strigosus* Dalz. in Hook. Journ. Bot. 2:35. 1850. *Tephrosia tenuis* Wall. ex Dalz. & Gibs. Bombay Fl. 61. 1861. FBI 2:111; C 1:344.

Caespitose, slender, erect or suberect herbs. Leaves 1.2–4.7 × 0.2–0.8 cm, linear to linear-lanceolate, glaucous-green, densely hairy beneath, Flowers solitary, or few in leaf-opposed racemes. Pods 1.2–2.3 × 0.2–0.3 cm, linear, compressed, glabrescent. Seeds roundish, glabrous, smooth.

Throughout among grasses; not common.

FLS & FRS : Aug.–Sep.

Tephrosia tinctoria (L.) Pers. Syn. Pl. 2:329. 1807; FBI 2: 111; C 1:345; S & J 20; S 56. *Galega tinctoria* L. Syst. Nat. (ed. 10) 1172. 1759.

An erect undershrub, with velvety-brown pubescence. Leaves 5–10 cm long; leaflets 7–13, elliptic-oblong, more or less silvery beneath. Racemes longer than leaves, 3–12-flowered, fulvous hairy. Pods 5–7 cm long, 8–12-seeded, softly hairy, curved near the apex.

Santapau (1962) remarks "Common along railway lines from Viramgam to Rajkot in dense patches".

FLS & FRS : Sep.–Oct.

Tephrosia uniflora Pers. subsp. **petrosa** (Blatt. & Hallb.) Gillett & Ali in Kew Bull. 1958:114. 1958; Bhandari in Journ. Bombay nat. Hist. Soc. 62(2):334. 1965. *Tephrosia petrosa* Blatt. & Hallb. in Journ. Bombay nat. Hist. Soc. 26:239. 1918.

Suberect or diffuse, suffrutescent, appressed-silky hairy herbs. Leaves 1.5–3.5 cm long; leaflets 7–11, 0.5–2.5 × 0.2–0.7 cm, obovate to oblanceolate, appressed-silky beneath. Flowers violet, solitary or geminate, leaf-opposed, pedunculate. Pods 3.7–4.6 cm long, linear, flat, appressed-hairy. Seeds 9–12, 0.1–0.15 cm across, greenish-yellow, nearly spherical. smooth.

Kutch and Saurashtra but not reported by Santapau (1952) from the latter locality; rare.

FLS & FRS : Aug.

Tephrosia villosa (L.) Pers. Syn. Pl. 2:329. 1807; FBI 1:113; C 1:347. *Cracca villosa* L. Sp. Pl. 752. 1753. *Galega villosa* L. Syst. (ed.10) 1172. 1759. *Tephrosia hirta* Buch.-Ham. in Trans. Linn. Soc. 13:546. 1822; Ch & O 81; S & J 20.

Undershrubs, 30–90 cm tall, hairy. Leaves 3–7.2 cm long, alternate; leaflets 11–19, obovate to oblanceolate, silky-pubescent beneath. Flowers bright-violet-purple, fading light-pink or blue, fascicled, in 4–9.5 cm long racemes. Pods 1–3.8 × 0.2–0.5 cm, linear-oblong, falcate. Seeds 6–9, brownish-black, oblong, compressed, smooth, glabrous.

Throughout; common, scattered or subgregarious.

FLS & FRS : July–Feb.

TERAMNUS Sw.

Teramnus labialis (L.f.) Spreng. Syst. 3:235. 1826; FBI 2:184; C 1:387; S & J 20; S 64. *Glycine labialis* L. f. suppl. 325. 1781.

Trailing or twining, hairy herbs. Leaflets 1.5–11 × 0.8–5.5 cm, ovate-elliptic or oblong, membranous or subcoriaceous, appressed-hairy. Flowers violet-purple, fading pale-blue or white,

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in 3–13.5 cm long, axillary and terminal racemes. Pods 1–2.5 cm long, linear, straight, curved, nearly glabrous when mature, shortly beaked. Seeds 2–9, smooth, polished, reddish-brown or dark-brown, oblong, rounded at ends.

Throughout, on hedges and low shrubs, or trailing in absence of support; common.

FLS & FRS : Throughout the year.

TRIFOLIUM L.

Trifolium repens L. Sp. Pl. 767. 1753; FBI 2:86; Bailey 581.

Annual or perennial, trailing, glabrous herbs. Leaves 3-foliolate, petiolate; leaflets 0.7–2×0.6–1.3 cm, obovate, glabrascent, nigro-punctate beneath. Flowers creamy-yellow or nearly white, sometimes with a pinkish tinge, in globose, capitate head. Pods 0.9–1.6 cm long, linear, flattened, 3–5-seeded, beaked.

Cultigen at Bulsar (Dr. Patel R. M., 1971).

FLS & FRS : Sep.–Nov.

TRIGONELLA L.

1. Plants usually cultivated, seldom an escape; erect; pods more than 2 cm long, with a long beak .. *T. foenum-graecum*
1. Plants wild; prostrate diffuse or suberect; pods not more than 2 cm long and usually not beaked :
   2. Pods 0.15–0.2 cm long, ellipsoid-oblong, hairy, 1–2 seeded .. .. *T. occulta*
   2. Pods more than 0.2 cm long, linear, glabrous, more than 2-seeded :
      3. Pods 1–1.8 cm long, falcately recurved .. *T. corniculata*
      3. Pods 0.5–0.6 cm long, not as above .. .. *T. hamosa subsp. uncata*

Trigonella corniculata L. Syst. (ed. 10) 1180. 1759; FBI 2:88; Shah & Patel in Ind. For. 97:636. 1971.

Herbs. Leaflets 0.8–1.2×0.4–0.7 cm, obovate, inciso-dentate in upper half, pubescent. Flowers 0.4–0.7 cm long, creamy-white to pale-yellow, in compact racemes, at ends of branches. Pods linear, falcately recurved, prominently reticulately veined. Seeds oblong, brown, glabrous.

North Gujarat (Shamlaji); rare.

FLS & FRS : Jan.

Trigonella foenum-graecum L. Sp. Pl. 777. 1753; FBI 2:87; Bailey 583; S & J 20.

Herbs, 10–50 cm tall, glabrous or faintly hairy in younger parts. Leaflets 1–3.5×0.4–1.5 cm, obovate or oblanceolate, glabrous or nearly so, minutely dentate. Flowers creamy-yellow, subsessile, terminal, solitary, or a few in condensed racemes. Pods 4.2–13.5 cm long, linear, subtorulose, almost glabrous, with 2.5–4.5 cm long beak. Seeds yellowish-brown, subquadrate-oblong, glabrous, smooth.

Cultivated; also an escape. (METHI)

FLS & FRS : Throughout the year.

Trigonella hamosa L. subsp. **uncata** (Boiss. & Noe) C. C. Townsend in Kew Bull. 21 (3):437. 1968. *Trigonella uncata* Boiss. & Noe in Boiss. Diagn. (Ser.2) 2:12. 1856; Shah, Patel and Patel in Journ. Bombay nat. Hist. Soc. 65:262. 1968. *Trigonella hamosa* L. Syst. (ed.10) 1180. 1759; FBI 2:88.

Slender, glabrous herbs. Leaflets 0.3–0.5 cm long, sessile or shortly petiolate, obovate, glabrous, sharply inciso-serrate in upper half. Flowers yellow, 0.2–0.3 cm long, 4–6, in axillary, capitate racemes. Pods glabrous, linear, curved, shortly beaked, 4–6-Seeded.

Panchmahals (Sevalia) and Broach district (Madhi, Shuklatirth); rare.

FLS & FRS : Dec.–Jan.

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Trigonella occulta Del. Fl. Aegypt. Illustr. 71. 1812; FBI 2:87; C 1:325; S 54.

Caespitose, glabrous herbs. Leaflets 1.5-2.5×0.7-1.2 cm, obovate or oblanceolate, sharply toothed, subglabrous. Flowers yellow, sessile, axillary, in clusters, of 2-4. Seeds oblong, smooth, yellowish-brown.

North Gujarat (Kadi, Idar), among grasses along margins of ponds; rare.

FLS & FRS : Feb.

URARIA Desv.

1. Leaves one and three-foliolate, mixed; leaflets ovate or elliptic-oblong .. .. *U. rufescens*
1. Leaves 5-7(-3)-foliolate; leaflets linear-lanceolate or linear-oblong, variegated ... . *U. picta*

Uraria picta Desv. in Journ. Bot. 1:123. t. 5. f. 19. 1813; FBI 2:155; C 1:367; S & J 20. *Doodia picta* Roxb. Fl. Ind. 3:368. 1832.

Perennial, appressed-pubescent undershrubs. Leaves 25-32 cm long; leaflets 4-24.2×1.3-2.5 cm, subcoriaceous glabrous. Flowers 0.4-0.7 cm long, purple, in close fascicles, in 15-22 cm long racemes. Pods 3-6-jointed, joints annular, placed one above the other, dark-black, glabrous. Seeds yellowish-to reddish-brown, reniform, compressed, glabrous, faintly reticulate.

North, central and south Gujarat; rare. (PITHVAN, PILOSAMERVO, KABARCHITRO).

FLS & FRS : Sep.-Oct.

Uraria rufescens (DC.) Schindl. in Fedde, Repert. Sp. Nov. 21:14. 1925; Santapau & Shah in Journ. Bombay nat. Hist. Soc. 62(2):201-202. 1965. *Desmodium rufescens* DC. in Ann. Sci. Nat. 4:101. 1825. *Hedysarum hamosa* Roxb. Hort. Beng. 57. 1814 (nomen). *Uraria hamosa* Wall. Cat. 5081 B. 1828 (nomen); FBI 2:156. *Doodia hamosa* Roxb. Fl. Ind. 3:367. 1832.

0.5-1 m tall, finely fulvous-hairy undershrubs. Leaflets 3.8-8.6×3.2-3.8 cm, pubescent beneath. Flowers bright-purple, fading blue, in 10-22 cm long, terminal and axillary recemes. Pods 0.6-0.8 cm long, 4-8-jointed; joints annular, hairy. Seeds yellowish-brown, globose or subreniform, glabrous, smooth.

So far found in the forest undergrowth at Dangs, Vyara and Chhotaudepur.

FLS & FRS : Dec.-Mar.

VICIA L.

Key to species

1. Leaflets very narrowly linear-obovate, 0.05-0.1 cm broad .. .. *V. hirsuta*
1. Leaflets oblong to oblanceolate, 0.2-0.4 cm broad .. .. *V. sativa*

Vicia hirsuta (L.) S. F. Gray, Nat. Arr. Brit. Pl. 2:614. 1821; FBI 2:177. *Ervum hirsutum* L. Sp. Pl. 138. 1753.

Slender, straggling or climbing herbs. Leaves 2.4-3.5 cm long; leaflets 5-10 pairs, 0.4-1 cm long, appressed-pubescent.

Chhotaudepur forest division, a weed in cultivated fields; extremely rare.

FLS & FRS : Not seen.

Vicia sativa L. Sp. Pl. 736. 1753; FBI 2:178; Bailey 552.

Slender, suberect, tendrillar herbs. Leaves 1.8-2.5 cm long; leaflets 4-8 pairs, 0.4-1.3 cm long, appressed-pubescent, upper leaflets modified into tendrils.

Chhotaudepur forest division, a weed in cultivated fields; very rare.

FLS & FRS : Not seen.

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VIGNA Savi

Key to species, subspecies and varietes.

1. Keel spirally twisted :
   2. Pods glabrous or puberulous, terete or subcompressed :
      3. Pods cylindric, leaflets lobed; seeds rounded at ends :
         4. Leaflets shallowly lobed; stipules ovate-oblong or ovate-elliptic, foliaceous; plants wild .. *V. trilobata*
         4. Leaflets deeply 2–7-lobed; stipules lanceolate, but not foliaceous; plants cultivated, at times escaped .. .. *V. aconitifolia*
      3. Pods subcompressed; leaflets entire or obscurely lobed; seeds truncate at ends :
         5. Stem and pods glabrous or nearly so; leaflets under 5 cm long .. .. .. *V. dalzelliana*
         5. Stem clothed with stiff deflexed hairs; pods hirtellous or puberulous; leaflets above 5 cm long .. .. *V. umbellata*
   2. Pods hirsute :
      6. Stipules foliaceous, 3.5–5×2.5–3.5 cm .. .. *V. khandalensis*
      6. Stipules not foliaceous; if foliaceous not of the above size :
         7. Plants wild, usually twining .. *V. radiata* .. .. var. *sublobata*
         7. Plants cultivated or escape, erect or suberect, not twining or shortly twining :
            8. Pods radially spreading or reflexed .. .. *V. radiata* var. *radiata*
            8. Pods erect or suberect .. .. *V. angularis*

1. Keel not as above :
   9. Plants wild, usually twining; stipules basifixed; keel beaked .. .. *V. vexillata*
   9. Plants culivated, at times escaped; stipules often peltate and distinctly spurred at base; keel not beaked :

   10. Flowers bright rosy-purple, fading white; pods 6–20 cm long, cylindric, at times somewhat torulose .. .. *V. unguiculata* subsp. *cylindrica*
   10. Flowers yellow; pods 2.4–6.3 cm long, compressed, falcate .. .. .. *V. unguiculata* subsp. *unguiculata*

Vigna aconitifolia (Jacq.) Marechal in Bull. Jard. Bot. Nat. Belge 39:160. 1969; Verdcourt in Kew Bull. 23:469. 1969. *Phaseolus aconitifolius* Jacq. Obs. Bot. 3:2. f. 52. 1768; FBI 2:202; C 1:403; S & J 19.

Suberect or diffuse, nearly glabrous herbs. Leaflets 1.4–6.5×2.3–4.6 cm, lobes linear-lanceolate. Flowers pale-to bright-yellow, in short, condensed, capitate racemes. Pods 2–6 cm long, subcylindric, glabrous or nearly so. Seeds 3–8, brown, smooth, glabrous.

Cultivated; also an escape. (MATH)
FLS & FRS : Aug.–Jan.

Vigna angularis (Willd.) Ohwi & Ohashi in Journ. Jap. Bot. 44:29. 1969; Verdcourt in Kew Bull. 24:557. 1970. *Dolichos angularis* Willd. Sp. Pl. 3:1051. 1802. *Phaseolus mungo* auct. non Linn. 1753; FBI 2:203; C 1:403. *Phaseolus angularis* (Willd.) W. F. Wight in U. S. Dept. Agri. Bull. Pl. Ind. 137:17. 1909; Ch & O 79; S & J 19.

Annual, patently hairy herbs. Leaflets 2–8×1.5–6 cm, broadly ovate to ovate-rhomboid, appressed-hairy. Flowers yellow, in 1–1.5 em long, congested, capitate racemes. Pods 1.2–4.6×0.3–0.6 cm, compressed, linear-oblong, densely hairy. Seeds 10–15, subquadrate to nearly spherical, smooth, black or greenish-black.

Cultivated; also an escape.
FLS & FRS : Sept.–Nov.

Vigna dalzelliana (O. Ktze.) Verdcourt in Kew Bull 24:558. 1970. *Phaseolus pauciflorus* Dalz. in Hk. Journ. Bot. 3:209. 1851; FBI 2:202 (non Bth. 1837). *Phaseolus dalzelliana* O. Ktze. Rev.

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Gen. Pl. 202. 1891. *Phaseolus dalzelli* Cooke, Fl. Pres. Bombay 1:376. 1902 & 1:401. 1958 (reprinted); S & J 19.

Twining herbs. Leaflets 2–7×1.2–5 cm, membranous, ovate or ovate-rhomboid, glabrescent. Flowers yellow, in 1.5–5 cm long, axillary racemes. Pods 3.2–5 cm long, subcylindric, 6–8-seeded. Seeds dark-brown, glabrous, smooth.

South Gujarat (Rajpipla, Dangs) and Saurashtra; very rare.

FLS & FRS : Oct.–Nov.

Vigna khandalensis (Sant.) Bole & Shah comb. nov. *Phaseolus khandalensis* Sant. in Kew Bull. 1948:276. 1948 & Fl. Khandala 68.1967. *Phaseolus grandis* Dalz. & Gibs., Bombay Fl. 72. 1861; FBI 2:202; C 1:400 (non Wall. Cat. 5602 & Bth. in Miq. Pl. Jungh. 239. 1852 in nota). *Vigna grandis* (Dalz. & Gibs.) Verdcourt in Kew Bull. 23:464. 1969 & 23:558. 1970.

Stout, erect strigosely hairy undershrubs. Leaflets 7–13×5.5–14 cm, apressedly hairy, broadly deltoid. Flowers yellow, in congested racemes. Pods 4–5×0.4–0.5 cm, appressed-hairy. Seeds dark-brown, rough, cylindrical.

Dangs (Saputara), gregarious. (BADMUNG).

FLS & FRS : Sep.–Oct.

Vigna radiata (L.) Wilczek var. **radiata**; Verdcourt in Kew Bull. 24:559. 1970. *Phaseolus radiatus* L. Sp. Pl. 725. 1753; FBI 2:203; C 1:403; S & J 19.

Trailing or twining, slender, patently hairy herbs. Leaflets 5–7.5×0.4–7.1 cm, ovate, ovate-rhomboid, appressed-hairy. Flowers yellow, in capitate racemes. Pods 2–6.2 cm long, straight or slightly curved, linear-cylindric.

Cultivated; also an escape. (ADAD, UDAD)

FLS & FRS : Aug.–Dec.

Vigna radiata (L.) Wilczek var. **sublobata** (Roxb.) Verdcourt in Kew Bull. 24:559. 1970. *Phaseolus sublobatus* Roxb. Fl. Ind. 3:288. 1832; C 1:402. *Phaseolus trinervius* W. & A. Prodr. 245. 1834; FBI 2:203. *Phaseolus radiatus* auct. non L.; Ch & O 78; S & J 19.

Patently hairy herbs. Leaflets 4.5–12×3.6–7.5 cm, ovate to ovate-rhomboid, appressed-hairy. Flowers yellow, in short, condensed racemes. Pods 2–6 cm long, subterete or subcompressed, linear-oblong, hairy. Seeds black or green, smooth, glabrous, shining.

Throughout. (JANGLI MUG, ADBAUMUG, RANI MUG),

FLS : July–Oct. *FRS* : July–Nov.

Vigna trilobata (L.) Verdcourt in Taxon 17:172. 1968. *Dolichos trilobatus* L. Mant. 101. 1767. *Phaseolus trilobus* auct. non *D. trilobus* L.; FBI 2:201; C 1:401; S & J 19.

Trailing or suberect, slender, patently hairy to nearly glabrous herbs. Leaflets 1.2–5.6×0.8–6.3 cm, broadly ovate to ovate-elliptic, glabrous or sparsely hairy. Flowers yellow, in capitate racemes. Pods 2.5–5 cm long, linear-cylindric, glabrous. Seeds subreniform, brownish-black, smooth.

Throughout in plains, everywhere.

FLS & FRS : Aug.–Oct.

Vigna umbellata (Thunb.) Ohwi & Ohashi in Journ. Jap. Bot. 44: 31. 1969; Verdcourt in Kew Bull. 24:560. 1970. *Dolichos umbellatus* Thunb. in Trans. Linn. Soc. 2:339. 1794. *Phaseolus calcaratus* Roxb. Fl. Ind. 3:289. 1832; FBI 2:203.

Prostrate or twining. Leaflets 5–7.5×3.5–6.5 cm, ovate-rhomboid or ovate-elliptic, appressed-hairy. Flowers yellow, in congested racemes. Pods 5–5.5 cm long, compressed, hirtellous or puberulous. Seeds 14–16, dark-green, cylindric.

Dangs, among grasses; frequent.

FLS & FRS : Sep.

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Vigna unguiculata (L.) Walp. subsp. **cylindrica** (L.) Eseltine in Hendrick, Vegetables of New York 1:11. 1931; Verdcourt in Kew Bull. 24:544. 1970. *Phaseolus cylindrica* L. Herb. Am. 23. 1754. *Dolichos sinensis* L. Cent. Pl. 2:28. 1756. *Dolichos catjang* Burm. f Fl. Ind. 161. 1768. *Vigna catjang* (Burm. f.) Walp. in Linnaea 13:533. 1839; FBI 2:205; C 1:405. *Vigna unguiculata* (L.) Walp. Repert. 1:779. 1842; S 70. *Vigna sinensis* (L.) Savi ex Hassk. Cat. Hort. Bogor. 279. 1844; Bailey 576.

Trailing or twining annuals. Leaflets 3–13×2–11 cm, ovate to ovate-lanceolate or ovate-rhomboid, glabrous. Flowers bright-purple or lilac, in condensed racemes. Pods 6–20 cm long, olive-green, linear, torulose, glabrous. Seeds deep-pinkish-red, oblong, smooth, glabrous.

Cultivated, seldom an escape. (CHOLI)

FLS & FRS : Aug.–Dec.

Vigna unguiculata (L.) Walp. subsp. **unguiculata**; Verdcourt in Kew Bull. 24:543. 1970. *Dolichos unguiculatus* L. Sp. Pl. 725. 1753. *Dolichos biflorus* L. Sp. Pl. 727. 1753; FBI 2:210; C 1:407; Ch & O 79; S & J 18; S 71.

A slender, suberect or twining annual. Leaflets 2.5–6.2× 1.3–3.8 cm, ovate-elliptic, pilose, ciliate on margins. Flowers yellow, 1–3, axillary. Pods 1.5–5×0.4–0.7 cm, linear, flat, appressed-hairy, slightly falcate. Seeds 0.35–0.45 cm long, dark-red to reddish-brown, elliptic or reniform, glabrous, smooth.

Cultivated at some places; also an escape. (KULTHI, KULITH).

FLS & FRS : Aug.–Nov.

Vigna vexillata (L.) A. Rich in Hist. Fis. Polit. nat. 1. Cuba (Spanish ed.) 11:191. 1845; FBI 2:206; Verdcourt in Kew Bull. 24:554. 1970. *Phaseolus vexillatus* L. Sp. Pl. 724. 1753. *Vigna capensis* (L.) Walp. in Linnaea 13:553. 1839; C 1:404; S 70.

Perennial or annual, herbaceous twiner. Leaflets 2.3–9× 2–7 cm, ovate, ovate-rhomboid or ovate-lanceolate, membranous,

thinly appressed-hairy. Flowers 1.8–2.6 cm long, few, in capitate racemes. Pods 6–17 cm long, linear, subterete appressed-hairy. Seeds 10–15, subreniform, compressed, glabrous, smooth.

North, Central and South Gujarat; very rare.

FLS & FRS : Sep.

ZORNIA J. F. Gmel.

Zornia gibbosa Span. in Linnaea 15:192. 1841; S & J 20. *Zornia diphylla* auct. plur. non Pers.; FBI 2:147; C 1:355.

Annual herbs, 10–30 cm tall. Leaves bifoliolate; leaflets 0.5–3.2×0.2–1 cm, lanceolate to ovate-lanceolate, glabrous, black-dotted beneath. Flowers yellow, in 5–10 cm long, terminal and axillary, spicate racemes. Pods 1–2.5 cm long, 2–6-jointed, joints echinate. Seeds smooth, polished, yellowish-brown.

Throughout; common. (SAMARAPANI).

FLS & FRS : Aug.–Apr.

CAESALPINIACEAE

Key to species

1. Leaves bipinnate ;
   2. Flowers in racemes or panicles :
      3. Sepals imbricate :
         4. Pobs not winged (except slightly in *Caesalpinia decapetala*)... ... .*Caesalpinia*
         4. Pods winged .. .. *Peltophorum*
      3. Sepals valvate :
         5. Flowers scarlet, reddish-orange, creamy-white or pale-golden-yellow; pods flat; plants unarmed .. .. *Delonix*
         5. Flowers bright-yellow; pods turgid, moniliform; plants armed .. .. *Parkinsonia*
   2. Flowers in spike .. .. *Wagatea*

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1. Leaves simple pinnate :

6. Petals 5; stamens 10, all fertile or 3–5 sterile .. *Cassia*

6. Petals 3; fertile stamens 3 .. .. .. *Tamarindus*

6. Petals 0; fertile stamens 10 :

7. Leaflets 1–pair, each leaflet bilobed; calyx tube short; ovary sessile, two ovulate; pod 1–seeded .. *Hardwickia*

7. Leaflet pairs 4–6; calyx tube long; ovary stalked, many ovulate; pod 4–8–seeded .. .. *Saraca*

1. Leaves 1 (2)–foliolate, more commonly deeply cleft from the apex :

8. Woody tendril climbers .. .. .. *Phanera*

8. Trees or shrubs, erect :

9. Calyx spathaceous; style distinct, slender .. *Bauhinia*

9. Calyx lobed or toothed; style minute or if present thick .. .. *Piliostigma*

BAUHINIA L.

Key to species

1. Fertile stamens 10; flowers pale–to creamy–yellow or bright–yellow; leaves 2.5–6×4–8.5 cm, prominently 7–9–nerved; lobes obtuse :

2. Flowers 8–10 cm across, solitary or paired; pods 10–13×1.2–1.6 cm, flat, veined.. .. .. ..*B. tomentosa*

2. Flowers not more than 3 cm across, in pendulous racemes; pods 15–20×1.5–2.7 cm, turgid, faintly veined.. .. .. *B. racemosa*

1. Fertile stamens 3; flowers pale–to bright rosy–purple; leaves 3–17.3×3.5–17 cm, prominently 9–13–nerved; lobes obtuse or subacute .. .. *B. purpurea*

Bauhinia purpurea L. Sp. Pl. 375. 1753; FBI 2:284; C 1:461; WI 1:160; S & J 20.

6–10 m tall trees; bark grey or dark–brown. Leaves suborbicular, coriaceous, deeply lobed, cordate at base, petiolate. Flowers 3–8 cm across, in 5–12 cm long, terminal racemes. Pods 20–25×2–2.5 cm, linear, flat, apiculate reddish–brown, woody pendent. Seeds globose, smooth, glabrous.

Throughout, wild in deciduous forests; also planted in gardens. (KANCHNER, SHWET KANCHNER, CHAMPAKA-THI)

FLS & FRS : Sep.–Feb.

Bauhinia racemosa Lam. Encycl. Meth. 1:390. 1783; FBI 2:276; C 1:459; WI 1:160; Ch & O 91; S & J 20.

Deciduous, 3–5 m tall trees; bark dark–brown, rough, longitudinally fissurred. Leaves suborbicular, cordate at base, bilobed, glabrous above, pubescent beneath, petiolate. Flowers creamy–yellow, in 4–7 cm long, terminal and leaf–opposed racemes. Pods linear–oblong, woody, slightly curved, dark–brown or brownish–black, constricted between all or few seeds. Seeds oblong, compressed, smooth, glabrous, brown.

Throughout in deciduous and scrub forests. (KASOTRI, ASOTRI, APTO, ASONDARO, RAKTA KANCHNAR)

FLS : Jan.–June. *FRS* : Throughout the year.

Bauhinia tomentosa L. Sp. Pl. 375. 1753; FBI 2:275; C 1:459; WI 1:160; S & J 20.

Large shrubs or small trees, tomentose in younger parts. Leaves broader than long, pubescent beneath, petiolate. Flowers (1) 2 (3), on short axillary or leaf–opposed peduncle. Pods black, veined. Seeds 8–12, oblong, smooth, glabrous.

Wild in Saurashtra (Girnar, between Girnar temple and Junagadh and Barda hill); and north Gujarat (Sarneshwar and Vireshwar); abundant in Saurashtra, rare in north Gujarat. (PILO ASONDARO)

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CAESALPINIA L.

Key to species

1. Armed climbers :
   2. Pods spiny.. .. ..*C. crista*
   2. Pods not spiny.. .. ..*C. decapetala*
1. Trees or shrubs, unarmed or weakly armed :
   3. Trees, unarmed; leaflet pairs 13-17; pods twisted.. .. ..*C. coriaria*
   3. Shrubs, weakly armed; pods flat, not twisted... .. ..*C. pulcherrima*

Caesalpinia coriaria Willd. Sp. Pl. 2:532. 1799; C 1:440; WI 2:2. f. 1; S & J 20.

5–7 m tall trees. Leaves 4–8 cm long; leaflets 0.4–0.7×0.1–0.3 cm, linear-oblong. Flowers greenish-yellow, in 4–10 cm long, terminal panicles. Pods 3–4×1–1.7 cm, shortly apiculate.

Planted along roads and gardens. (LIBI-LIBI; DIVI-DIVI)

FLS & FRS : Sep.-Oct.

Caesalpinia crista L. Sp. Pl. 380. 1753 (pro maj. parte excl. Fl. Zeyl. 157); WI 2:3. f. 2; Ch & O 94; S & J 20. *Guillandina bonducella* L. Sp. Pl. (ed. 2) 545. 1762. *Caesalpinia bonducella* (L.) Flem. in As. Res. 11:159. 1810; FBI 2:254; C 1:437.

Extensive, scandent shrubs. Leaves 15–18 cm long; pinnae 4–20 pairs; leaflets 1–4.5×0.8–2.5 cm, elliptic-oblong, glabrous above, puberulous beneath. Flowers yellow, in 6–15 cm long, terminal and axillary racemes. Pods 5–8×2.8–4.5 cm, ovoid-oblong, somewhat flattened. Seeds oblong, smooth, polished, lead-coloured.

Throughout, on hedges. (KACHKA)

FLS : July-Dec. *FRS* : Sep.-Dec.

Caesalpinia decapetala (Roth) Alst. in Trim. Handb. Fl. Ceylon 6 (Suppl.) : 89. 1931. *Reichardia decapetala* Roth, Nov. Pl. Sp. 212. 1821. *Caesalpinia sepiaria* Roxb. Hort. Beng. 32. 1814 (nomen) & Fl. Ind. 2:360. 1832; FBI 2:256; C 1:439.

Shrubs. Leaves 9–15 cm long; pinnae 5–10 pairs; pinna 5–8 cm long; leaflets 8–12 pairs, 1.2–2×0.5–0.8 cm, oblong, glabrescent or nearly so above, hairy beneath. Flowers bright-yellow, in 15–30 cm long, axillary and terminal racemes. Pods 8–12×2.5–3 cm, straight or slightly curved, linear-oblong, slightly turgid, reticulately veined, slightly winged, constricted between seeds. Seeds 6–8, greenish-mottled, glabrous, smooth.

Bulsar and Surat, on hedges, not frequent.

FLS & FRS : Nov.

Caesalpinia pulcherrima (L.) Sw. Obs. 116. 1791; FBI 2:255; C 1:440; WI 2:5. f. 4; Ch & O 94; S & J 20. *Poinciana pulcherrima* L. Sp. Pl. 380. 1753; Bailey 589.

1.5–3 m tall shrubs; bark greyish-brown, rough. Leaves 15–30 cm long, alternate; pinnae 4–9 pairs; leaflets, 8–12 pairs 1.2–2.5×0.5–0.9 cm, sessile, oblong, rarely obovate. Flowers yellow or reddish-yellow, in 8–30 cm long, terminal racemes. Pods 6–10.5×1–1.7 cm, broadly linear, flat, glabrescent. Seeds 8–10, obovate-oblong, smooth, glabrous.

Ornamental. (SHANKHASUR, GALTORA)

FLS & FRS : Throughout the year.

CASSIA L.

Key to species and varieties

1. Trees :
   2. Fertile stamens 20; pods 30 cm or more long, cylindric :
      3. Flowers red or pink :
         4. Filaments swollen in the middle.. ..*C. javanica*
         4. Filaments not swollen in the middle..*C. roxburghii*

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3. Flowers yellow.. .. ..*G. fistula*

2. Fertile stamens 6–7; pods not more than 30 cm long, narrowly linear or lanceolate.. .. ..*C. siamea*

1. Shrubs, undershrubs or herbs :

5. Fertile stamens 7, rest staminodes :

6. Glands between one or more pairs of leaflets; leaflets obovate, obovate–oblong or elliptic–oblong :

7. Leaflet pairs 3; leaflets obovate; stipules linear subulate; herbs or undershrubs :

8. Gland present between each of two leaflet pairs towards base; pedicel 0.5–1 cm long, in fruit 1.5 cm long; anthers of posterior three largest stamens not constricted below apex; areola on seed 0.15–0.2 cm broad.. .. ..*C. tora*

8. Gland present only between the basal most leaflet pair; pedicel 1.2–3.5 cm long, in fruit 1.5–4.5 cm long; anthers of three largest posterior stamens constricted below apex; areola on seed 0.3–0.5 cm broad.. .. ..*C. obtusifolia*

7. Leaflet pairs 8–12; leaflets elliptic–oblong or ovate–oblong; stipules foliaceous, auricled; shrubs.. .. ..*C. auriculata*

6. Gland solitary on rachis but not between pairs of leaflets; leaflets lancolate, ovate–lanceolate or lanceolate–oblong.

9. Leaflets 3–5 pairs.. .. .. ..*C. occidentalis*

9. Leaflets 6–10 pairs :

10. Stem and branches stout, but not purple–coloured; leaflets 1.5–5×0.7–1.3 cm.. .. ..*C. sophera* var. *sophera*

10. Stem and branches slender, deep-purple; leaflets 0.6–2.8×0.3–1.2 cm... .. ..*C. sophera* var. *purpurea*

6. Rachis without gland; leaflets obovate or oblong :

11. Pods with a longitudinal crest.. .. ..*C. italica* subsp. *micrantha*

11. Pods without longitudinal crest :

12. Pods 2.5–3.2 cm long.. ..*C. holosericea*

12. Pods more than 3 cm long :

13. Leaflets oblong, 10–16 pairs; pods 7–12 ×1–1.5 cm.. .. ..*C. montana*

13. Leaflets linear–lanceolate, 5–7 pairs; pods 3-6×1.5–2 cm.. .. ..*C. angustifolia*

5. Fertile stamens 5, staminodes absent :

14. Leaflet pairs 2; pods usually vertical, appressed to stem .. ..*C. absus*

14. Leaflet pairs 10–20; pods not as above.. ..*C. pumila*

5. Fertile stamens 10 :

15. Leaflet pairs 8–20; gland solitary; inserted beneath leaflets, stalked, peltate.. .. .. ..*C. kleinii*

15. Leaflet pairs 4–6; gland inserted between each of the two lowest pairs of leaflets.. ..*C. surattensis*

15. Leaflet pairs more than 20; gland solitary, sessile inserted beneath leaflets :

16. Leaflets 16–24 pairs; stamens 10, with 1–3 staminodes.. ... .*C. leschenaultiana*

16. Leaflets 40–60 pairs; stamens 10, all fertile.. .. ..*C. mimosoides*

Cassia absus L. Sp. Pl. 376. 1753; FBI 2:265; C 1:451; WI 2:93; Ch & O 91; S & J 20; S 79.

Suffruticose, erect, 45–60 cm tall herbs, clothed with white pubescence. Leaves 3–5 cm long; leaflets 0.8–4.5×0.6–2.6 cm, ovate–oblong or ovate–elliptic. Flowers pure yellow or tinged red, in terminal and leaf-opposed, 2.5–4 cm long racemes. Pods 3–4×0.4–0.6 cm, linear–lanceolate dark–brown, glabrescent. Seeds 3–5, shining, black, smooth, glabrous, compressed, oblong.

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Throughout in the forest undergrowth in shaded spots along roads and railway lines. (CHIMED, CHON)

FLS & FRS : Aug.-Dec.

Cassia angustifolia Vahl, Symb. Bot. 1:29. 1790; FBI 2:264; C 1:450; WI 2:93. f. 44.

Shrubs, 1–1.5 m tall, glabrous, with pale-yellowish-brown bark. Leaves alternate, 6–8 cm long; leaflets 5–7 paired, 1–3 × 0.4–0.8 cm, glabrous, or nearly so. Flowers greenish-yellow, in 6–8 cm long, terminal racemes. Pods 3–6 × 1.5–2 cm, oblong, rarely obovate, greenish-black, shortly beaked at apex.

The species, listed by Saxton & Sedgwick (1918) under *C. holosericea*, is this species which is collected by Saxton from Gujarat College garden, but not planted. (SON-MAKKAI)

FLS & FRS : Dec.

Cassia auriculata L. Sp. Pl. 379. 1753; FBI 2:263; C 1:448; WI 2:96. Pl. 6; Ch & O 92; S & J 21.

Erect, bushy shrubs, 1–2 m tall. Leaves 2.5–8 cm long; leaflets 0.8–2.1 × 0.5–1.2 cm, glabrous above, pubescent beneath. Flowers yellow with orange veins, in axillary and terminal, 6–8 cm long racemes. Pods 10–12 × 1.2–1.6 cm, linear, flat, pale-to dark-brown, beaked. Seeds laterally compressed.

Throughout in plains; common in semi-arid and arid regions. (AVAL, AVALI, AVAR)

FLS & FRS : Throughout the year.

Cassia fistula L. Sp. Pl. 377. 1753; FBI 2:261; C 1:444; WI 2:97. Pl. 7; Ch & O 93; S & J 21; S 79.

6–12 m tall, deciduous trees, with bark dark-brown and rough in older parts, grey and smooth in younger parts. Leaves 20–45 cm long; leaflets 4–8 pairs (seldom with an odd terminal leaflet), 8–20 × 3–8.5 cm, ovate or elliptic-ovate, glabrous above,

abrescent beneath, subcoriaceous, petiolulate. Flowers bright golden-yellow in 20–40 cm long, lax, pendent, branched racemes. Pods 35–40 cm long, dark-blackish-brown, with faint horizontal veins. Seeds ovate or ellipsoidal, glabrous, smooth.

Throughout in deciduous forests, rare; also planted along roads and in gardens. (GARMALO) —

FLS : Mar.-June. *FRS* : Throughout the year.

Cassia holosericea Fresen. in Flora 1: 94. 1839; C 1:449.

60–75 cm tall, suffruticose, glabrous or sparsely hairy herbs. Leaves 6–9 cm long; leaflets 6–9 pairs, 0.7–1.2 × 0.4–0.5 cm, opposite. Flowers bright-yellow, in 7–10 cm long, terminal and axillary racemes. Pods 2.5–3.2 × 1–1.5 cm, oblong, falcate, glabrescent, flat. Seeds 4–10, obovate-cuneate, faintly reticulately rugose, flat, glabrous.

North Gujarat (Keshni); rare.

FLS & FRS : Sep.-Oct.

Cassia italica (Mill.) Lam. ex F. W. Andrews subsp. micrantha Brenan in Kew Bull. 1958: 239. 1958. *Cassia italica* (Mill.) Lam. ex F. W. Andrews, Fl. Anglo-Egypt. Sudan 2:117. 1952; S & J 21. *Cassia obtusa* Roxb. Hort. Beng. 31.1814 (nomen); C 1:448. *Cassia obovata* Colad. Hist. *Cassia* 92. t. 15 A. 1816; FBI 2:264.

Diffuse, 30–60 cm tall herbs, somewhat woody at base. Leaves 3–10 cm long; leaflets 3–5 pairs, 1–3 × 0.3–1.5 cm, opposite, glabrous. Flowers yellow, few, in 4–5 cm long, axillary and terminal racemes. Pods 2.5–3.2 × 1–1.3 cm, flat, papery, glabrous, oblong, falcate. Seeds cuneate, faintly reticulately rugose, polished, dark-brown.

Throughout in arid and semiarid regions. (MINDHI AVAL, PATAVAL, PAT MINDHIAVAL, BONYAVAL)

FLS & FRS : June-Jan.

Cassia javanica L. Sp. Pl. 379. 1753; FBI 2:267; Stearn in Blatter & Millard. Some Beaut. Indian Tr. (ed. 2) 27. Pl. 4. 1954.

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7.5–10 m tall trees, with grey or greyish-brown, nearly smooth bark. Leaves 15–30 cm long; stipules 1–2 cm long, semilunar; leaflets 12–16 pairs, 2–4.5×1.2–2 cm, elliptic-oblong, softly sparsely hairy. Pods dark-brown, glabrous, pendent.

Planted in gradens and along roads at some places; native of Java and Sumatra.

FLS : Mar.–May *FRS* : Apr.–July, often for a longer time on trees.

Cassia kleinii W. & A. Prodr. 293. 1834; FBI 2:266; C 1:452.

Perennial, woody, diffuse or suberect, 50–70 cm tall, appressed-hairy herbs. Leaves 2–8 cm long; leaflets 1.2–1.5×0.1–0.2 cm, sessile, linear-oblong. Pods 2.5–3×0.2–0.3 cm, flat, linear-oblong, slightly falcate, glabrous or nearly so, ciliate on margins.

North Gujarat (Mansa); rare, seen on the edges of a cultivated field.

FLS & FRS : Sep.

Cassia leschanaultiana Wall. ex DC. Prodr. 2:504. 1825; Gamble, Fl. Madras 1:286. 1957 (reprinted). *Cassia wallichiana* Wall. ex DC. Prodr. 2:505. 1825. *Cassia mimosoides* L. var. *wallichiana* Baker in Hk f. FBI 2:266. 1878.

This species much resembles *C. mimosoides* L. but differs from it in the size and number of leaflets (see key).

Dangs (Ahwa, *HS* 19362).

FLS : Oct.

Cassia mimosoides L. Sp. Pl. 379. 1753; FBI 2:266; C 1:453;

Erect or suberect, 60–90 cm tall, appressed-hairy herbs, woody at base. Leaves 4–11 cm long; leaflets 0.8–1.1×0.1–0.2 cm, linear-oblong, glabrous. Flowers yellow, 0.8–1 cm across,

axillary, solitary or 2–3-fascicled. Pods 4.5–5.5×0.4–0.5 cm, flat, linear, pubescent. Seeds 15–20, obliquely obovoid, compressed polished, brown.

Dangs (Subir and Malegaon forests); rare.

FLS & FRS : Aug.–Oct.

Cassia montana Heyne ex Roth, Nov. Pl. Sp. 214. 1821; FBI 2:264; C 1:450; S & J 21.

Small trees or large shrubs. Leaves 10–20 cm long; leaflets 2.5–4×1–1.5 cm, nearly glabrous above, hairy beneath. Flowers yellow, in axillary and terminal racemes. Pods straight or falcate, flat, membranous, glabrous.

Listed by Santapau (1962) from Saurashtra (Junagadh and Barda. (MOTIAVAL)

FLS : Not seen.

Cassia obtusifolia L. Sp. Pl. 377. 1753; FBI 2:263; C 1:447.

30–100 cm tall, suffruticose, glabrous herbs. Leaves alternate, 3–6 cm long; leaflets 1.5–4×1–2.8 cm, obovate-oblong, glabrous or nearly so. Flowers bright-yellow, 2.5–4.5 cm long, in axillary racemes. Pods 5–15×0.4–0.5 cm, linear-cylindric, faintly reticulate, beaked. Seeds oblong or sub-cylindric, dark-brown, smooth, glabrous.

Throughout, along roads and in the undergrowth of forests; not common. (PUNVADIO)

FLS & FRS : Sep.–Jan.

Cassia occidentalis L. Sp. Pl. 377. 1753; FBI 2:262; C 1:445; WI 2:97; Ch & O 92; S & J 21.

Erect, glabrous undershrubs, 0.5–1.5 m tall. Leaves 10–15 cm long; leaflets 1.5–10×0.8–4 cm, membranous, glabrous above, thinly hairy beneath. subsessile. Flowers bright-reddish-yellow, in 5–15 cm long, terminal and axillary racemes. Pods 7–11×0.6–0.8 cm, laterally compressed, linear-oblong. Seeds subcylindric, greenish-brown, smooth, glabrous.

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Throughout, common. (SUNDRO, VADISUNDRI, KASUDRI, SUNDEREN)

FLS & FRS : Throughout the year.

Cassia pumila Lam. Encycl. Meth. Bot. 1:65. 1783; FBI 2:266; C 1:452; Ch & O 92; S & J 21; S 79.

Prostrate, procumbent or suberect herbs. Leaves 2.4–7 cm long; leaflets 0.8–1.1 × 0.2–0.4 cm, linear-oblong, glabrous, sessile. Flowers pale-to bright-yellow, solitary or geminate, axillary. Pods 1.1–3.2 × 0.3–0.4 cm, linear-oblong or linear-lanceolate, pale-to dark-brown, pubescent. Seeds subquadrate or trapezoidal, brown, rounded or slightly acute at ends.

Throughout, common. (NIDHECHOLJOZAD, CHIMEDIYO, NANI CHIMED, BETHI CHIMED)

FLS & FRS : Aug.–Dec.

Cassia roxburghii DC. Prodr. 2:489. 1825; Stearn in Blatter & Millard, Some Beaut. Indian Tr. (ed. 2) 31. 1954: *Cassia marginata* Roxb. Hort. Beng. 31.1814 (nomen) & Fl. Ind. 2:338. 1832; FBI 2:262; C 1:454 (non Willd.)

4–8 m tall trees, with grey or yellowish-brown, smooth bark. Leaves 7–16.5 cm long, alternate; leaflets 6–11 pairs, 1–2.5 × 0.7–0.9 cm, opposite or subopposite, oblong, at length nearly glabrous. Flowers pink or red, in terminal racemes. Pods 30–35 cm long, pendent, seldom subtorulose, dark-brown, glabrous, reticulate. Seeds lenticular, compressed, smooth, glabrous, pale-yeliowish-brown.

Planted along roads and in gardens; native of Sumatra and Java.

FLS: Mar.–Oct. *FRS*: For most part of the year on trees.

Cassia siamea Lam. Encycl. Meth. Bot. 1:648. 1785; FBI 2:264; C 1;454; WI 2:98; S & J 21.

4–10 m tall trees, with light-blackish-brown, rough, longitudinally fissurred bark. Leaves 6–25 cm long; leaflets 4–14 [illegible] × 1.1–2.3 cm, coriaceous, ovate-oblong or elliptic

-oblong, minutely petiolulate. Flowers pale-yellow, 1.2–1.8 cm across, in terminal, 5–10 cm long, branched racemes. Pods 15–30 × 1–1.2 cm, blackish-brown, compressed, reticulate, somewhat constricted between seeds, stoutly beaked. Seeds flat, dark-brown, smooth, glabrous.

Planted along roads and in gardens.

FLS & FRS : Throughout the year

Cassia sophera L. var. **purpurea** (Roxb.) Baker in Hk. f. FBI 2:263. 1878; S & J 21. *Cassia purpurea* Roxb. Hort. Beng. 31. 1814 (nomen) & Fl. Ind. 2:342. 1832.

This variety, so far, is found at Broach, Vallabh Vidyanagar and Saurashtra; very rare. (JAMBLI SUNDRI)

FLS & FRS : Aug.–Jan.

Cassia sophera L. var. **sophera**. *C. sophera* L. Sp. Pl. 379. 1753; FBI 2:262; C 1:446; S & J 21.

1–2.5 m tall, nearly glabrous shrubs or undershrubs. Leaves 10–18 cm long; leaflets 6–10 pairs, 4–6 × 1.2–1.8 cm. Flowers 1.2–1.5 cm across, yellow, in terminal and axillary racemes. Pods 7–12 × 0.6–0.8 cm, linear-oblong apiculate, septate within. Seeds ovoid, flat, dark-brown.

Rajpipla, North Gujarat, Saurashtra and Kutch; rare. (SUNDRI, SUNDARI, NINDHI SUNDARI)

FRS & FLS : Aug.–Jan.

Cassia surattensis Burm. f. Fl. Ind. 97. 1768; Chatterjee in Journ. Bombay nat. Hist. Soc. 57:695. 1960; S & J 21. *Cassia glauca* Lam. Encycl. Meth. Bot. 1:647. 1785; FBI 2:265; C 1:453.

Large shrubs or small trees, 2–7 m tall. Leaves 10–18 cm long; leaflets 4–8 × 2.5–3.5 cm, elliptic-oblong, glabrous above, pubescent beneath. Flowers bright-yellow, in axillary racemes.

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Pods 15–20×1.2–2 cm, flat, glabrous, linear–oblong. Seeds oblong, compressed, glabrous, dark–brown, with a shallow, oblong pit on each face.

Reported by Santapau (1962) from Saurashtra.

FLS & FRS : Oct.–Nov.

Cassia tora L. Sp. Pl. 376. 1753; FBI 2:263; C 1:447; WI 2:98; Ch & O 92; S & J 21; S 79.

30–100 cm tall, suffruticose, glabrous herbs. Leaves 1.5–5.5 cm long; leaflets 1.5–5.5×1–3.5 cm, obovate, sessile. Flowers yellow or with reddish tinge, geminate, axillary. Pods 7.5–21 cm long, narrowly linear, falcate, subtorulose, reticulate, beaked.

Throughout; common, scattered or subgregarious; (KUVANDIO, POCHANDIO, DADHAJOZAD).

FLS : Aug.–Nov. *FRS* : Aug.–Dec.

DELONIX Raf.

Key to species

1. Flowers creamy–white to pale–golden–yellow; pods 15–25 cm long.. .. ..*D. elata*
1. Flowers scarlet or reddish–orange; pods 30–40 cm long .. ..*D. regia*

Delonix elata (L.) Gamble, Fl. Madras Pres. 396. 1919 & 1:280. 1957 (reprinted); WI 3:29; S & J 21. *Poinciana elata* L. Cent. Pl. 2:16. 1756; FBI 2:260; C 1:441.

5–10 m tall, deciduous trees, with ash–coloured or deep reddish–brown, smooth bark. Leaves 4–15 cm long; pinnae 4–6 pairs; leaflets 8–15 pairs, 0.7–1.1×0.3–0.4 cm, subsessile, oblong. Flowers 4–5.5 cm across, in 6–8 cm long, terminal racems. Pods 15–25×1.5–3 cm, pale–to dark–bown, linear or oblanceolate, glabrous, reticulate, beaked.

Surat, Broach, Rajpipla, Panchmahals, North Gujarat, Saurashtra; wild or cultivated. (SANDSRO)

FLS : Nov.–Apr. *FRS* ; Dec.–June

Delonix regia (Boj.) Raf. Fl. Tel. 2:92. 1836; WI 3:30. Pl. 6 (col.) & f. 15; S & J 21; S 78. *Poinciana regia* Boj. in Bot. Mag. t. 2884. 1829; FBI 2:260; C 1:442.

7–12 m tall, deciduous trees, with grey to pale–brown bark. Leaves 8–30 cm long; pinnae 8–20 pairs; leaflets 12–30 pairs, 0.8–1×0.4–0.5 cm, oblong, glabrous or nearly so. Flowers 4.5–5.5 cm across, in 8–20 cm long, terminal, simple or branched racemes. Pods 30–40×3–4 cm, broadly linear, woody, dark–brown or reddish–brown, flat, beaked. Seeds oblong, glabrous, smooth, white or creamy–white, mottled brown.

Planted in gardens and along road sides; native of Madagascar. (GULMOHOR)

FLS : Mar.–July *FRS* : Apr.–Aug.

HARDWICKIA Roxb.

Hardwickia binata Roxb. Pl. Cor. 3:6. t. 209. 1819; FBI 2:270; C 1:456; WI 5:6. ff. 5–6; S & J 21.

Trees, 15–20 m tall (in our area only 3–5 m), with dark–grey, rough bark. Leaflets 2.5–6×1–1.8 cm, sessile, obliquely ovate, glabrous. Flowers yellowish–green, in 3–5 cm long, slender racemes or terminal panicles. Pods 6–8×1–1.2 cm, strap–shaped, glabrous.

Saurashtra, Chhotaudepur and Bulsar; rare. (ANJAN)

FLS & FRS : Oct.–Jan.

PARKINSONIA L.

Parkinsonia aculeata L. Sp. Pl. 375. 1753; FBI 2:260; C 1:442; Bailey 588; WI 7:265; S & J 21.

A large shrub or a small tree, 3–6 m tall, with smooth bark. Leaves bipinnate; pinnae 1–2 pairs, 15–30 cm long; leaflets minute, ovate or oblanceolate, glabrous. Flowers 1.2–2

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cm acrooss, in 6-8 cm long, lax, terminal racemes. Pods 10-20 ×0.4-0.6 cm, linear, reticulate, glabrous. Seeds 2-7, ellipsoidal-oblong, smooth, dark-brown.

Planted as a hedge at many places; also an escape; native of Mexico. (RAMBAVAL)

FLS & FRS : Jan.-May

PELTOPHORUM (Vogel) Walp. nom. cons.

Peltophorum pterocarpum (DC.) Backer ex K. Heyne, Nutt. Fl. Ned. Ind. (ed. 2) 2:755. 1927; WI 7:291; S & J 21; S 77. *Inga pterocarpa* DC. Prodr. 2:441. 1825. *Peltophorum ferrugineum* (Decne.) Bth. Fl. Austr. 2:279. 1864; FBI 2:257.

5-16 m tall, evergreen trees, younger parts rusty-brown or greyish-tomentose. Leaves 12-30 cm long, alternate; pinnae 6-13 pairs; leaflets 6-17 pairs, 0.6-2×0:3-0.8 cm, oblong,. glabrous. Flowers bright-yellow, in 10-32 cm long, terminal and axillary, reddish-brown panicles. Pods 5-10 x 1.6-2.2 cm, lanceolate, dark-brown, woody. Seeds obovate-oblong, compressed, smooth, glabrous.

Planted in gardens and along roads. (TAMRAFALI)

FLS & FRS : Throughout the year.

PHANERA Lour.

Phanera integrifolia (Roxb.) Bth. Pl. Jungh. 263. 1852; de Wit in Reinwardtia 3(4):478. 1956; S 329. *Bauhinia integrifolia* Roxb. Hort. Beng. 90. 1814 (nomen) & Fl. Ind. 2:331. 1832. *Bauhinia vahlii* W. & A. sensu F.-Vill. Noviss. App. 72. 1880; FBI 2:279; C 1:461; WI 1:161. Pl. 24(3).

Extensive liana, rusty-tomentose in younger parts. Leaves 10-22×12-24 cm, suborbicular, densely tomentose beneath, petiolate. Flowers and fruits not seen.

Rajpipla (Kokam); very rare.

PILIOSTIGMA Hochst. nom. cons.

Key to species

1. Leaves 15-29×16-35 cm, 15-17-nerved, minutely pitted between nerves beneath; petiole 5-10 cm long; racemes 10-15 cm long.. .. ..*P. foveolatum*
1. Leaves 3-11×4.5-13.5 cm, (7-) 9-11-nerved, not pitted beneath; petiole 2.5-4.5 cm long; racemes 5-10 cm long .. .. *P. malabaricum*

Piliostigma foveolatum (Dalz.) Thoth. in Bull. bot. Soc. Beng. 19:131. 1965; S 329. *Bauhinia foveolata* Dalz. in Journ. Linn. Soc. 13:188. 1873; C 1:460. *Bauhinia lawii* Bth. ex Baker in Hk. f. FBI 2:277. 1876.

18-20 m tall trees, with dark-brown, rough, shallowly or deeply longitudinally fissurred bark. Leaves nearly orbicular, bilobed, coriaceous, glabrous or sparsely hairy above, more hairy beneath. Flowers pale- to bright-rosy. Pods 18-26×1.5-2 cm, reddish-brown, turgid, pendent, rufous-hairy.

Dangs, not common. (CHAMULI)

FLS : Sep.-Oct. *FRS* : Jan.-Mar.

Piliostigma malabaricum (Roxb.) Bth. in Miq. Fl. Jungh. 261. 1852; S 329. *Bauninia malabarica* Roxb. Hort. Beng. 31.1814 (nomen) & Fl. Ind. 2:321. 1832; FBI 2:277; C 1:460; WI 1:160.

9-14 m tall trees, with dark-brown, rough bark. Leaves nearly orbicular, coriaceous, bilobed, glabrous above, sparsely hairy beneath. Pods 18-25×1.8-2.2 cm, dark-brown, glabrous, apiculte, slightly curved, flat.

Dangs and Panchmahals; rare.

FLS : Sep.-Oct. *FRS* : Oct.-Dec.

SARACA L.

Saraca asoca (Roxb.) de Wilde in Blumea 15:353. 1968. *Jonesia asoca* Roxb. in As. Res. 4:355. 1795. *Saraca indica* auct. non L. 1767; FBI 2:271; C 1:456; S 80.

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5–7 m tall, evergreen trees, with dark-brown, rough bark. Leaves 15–30 cm long; leaflets oblong-lanceolate, glabrous, coriaceous, petiolulate. Flowers yellow or reddish-yellow, in 7–10 cm broad, paniculate corymbs on old wood, rarely axillary. Pods 10–20×3.5–5.5 cm, linear-oblong, flat, glabrous, coriaceous, veined. Seeds ellipsoid-oblong, slightly compressed, brown, smooth, glabrous.

Ornamental. (ASHOK)

FLS : Dec.–April, often throughout the year.

TAMARINDUS L.

Tamarindus indica L. Sp. Pl. 34. 1753; FBI 2:273; C 1:457; Bor 73; Ch & O 93; S & J 21.

A large, evergreen tree, 10–15 m tall; bark dark-grey or light-black, rough, longitudinally fissurred. Leaves 4–10 cm long; leaflets 6–12 pairs, 1–1.6×0.3–0.4 cm, linear-oblong, subcoriaceous, glabrous. Flowers yellow, with purple streaks, in 2–4 cm long, lax racemes. Pods 7–10×2–2.5 cm, subtorulose, somewhat falcate, linear-oblong, with rough, fibrous, grey epicarp. Seeds dark-chocolate-brown, polished, smooth, glabrous, rhomboidal truncate at base.

Throughout, planted or self sown, rarely wild in dense forest; probably a native of tropical Africa. (AMLI, AMBLIJO ZAD)

FLS : Mar.–July *FRS :* Apr.–Nov.

WAGATEA Dalz.

Wagatea spicata Dalz. in Kew Journ. Bot. 3:89. 1851; FBI 2:261; C 1:443.

Woody, armed climbers. Leaves 10–30 cm long; pinnae 4–6 pairs; leaflets 5–7 pairs, 1.5–4×0.6–1.8 cm, coriaceous, oblong, ovate-elliptic or elliptic-oblong. Flowers deep-orange-coloured,

in 10–50 cm long, terminal panicles. Pods 3.8–7×1.2–1.5 cm, linear-oblong, constricted between seeds. Seeds 3–4, obovate-oblong, horizontal.

Planted in Gujarat College Garden during the period of Saxton W. T. as a principal, and a herbarium specimen is maintained in that college.

FLS & FRS : Dec.

MIMOSACEAE (45)

Key to genera

1. Stamens definite, 4–10 :
   2. Flowers in globose heads :
      3. Flowers pink; pods armed with weak prickles; flowers tetramerous; stamens 4.. .. .. ..*Mimosa*
      3. Flowers yellow or creamy-white; stamens 10; pods unarmed :
         4. Flowers yellow; herbs; pods not more than 5 cm long; anthers gland-crested at least in early stages .. ..*Neptunia*
         4. Flowers creamy-white; shrubs or small trees; pods more than 5 cm long; anthers not gland crested .. ..*Leucaena*
   2. Flowers in spikes :
      5. Spike of two colours, lower half of rosy-pink to purple, sterile flowers, upper half of yellow, fertile flowers; pods twisted when mature.. .. ..*Dichrostachys*
      5. Flowers and pods not as above :
         6. Trees unarmed; pods long, falcate, strap-shaped, compressed, somewhat swollen above seeds, leathery, valves twisted after dehiscence; seeds lenticular -globose, bright-to deep-red, shining....*Adenanthera*
         6. Trees armed; pods turgid, cylindric or oblong, not leathery, torulose, straight, falcate or twisted; seeds flat, ovoid or oblong, pale-brown.. ..*Prosopis*

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1. Stamens indefinite :
   7. Mostly armed trees, shrubs or woody climbers; flowers in spikes or heads forming panicles;
      8. Flowers in heads, dirty-white or greenish-white; stamens monadelphous; pods falcate, often spirally twisted; pinna 1-paired.. .. ..*Pithecellobium*
      8. Flowers in heads or spikes, yellow or creamy-white; stamens free; pods flat, seldom turgid or torulose; pinnae more than 1-paired.. .. ..*Acacia*
   7. Unarmed trees; flowers always in globose heads :
      9. Flowers greenish-white.. .. .. ..*Albizia*
      9. Flowers rosy-pink.. .. ..*Samanea*

ACACIA Mill.

Key to species

1. Climbers :
   2. Leaflets 12–30 pairs :
      3. Pods thick, fleshy, when dry wrinkled; leaflet pairs 12–25.. .. ..*A. sinuata*
      3. Pods thin, strap-shaped, when dry not wrinkled; leaflet pairs 5–15.. .. ..*A. torta*
   2. Leaflets 30–50 pairs.. .. ..*A. pennata*
1. Trees or shrubs, erect :
   4. Flowers in heads :
      5. Heads axillary :
         6. Pods torulose.. .. ..*A. nilotica* subsp. *indica*
         6. Pods not torulose :
            7. Pods cylindric, turgid :
               8. Pods straight; petiole glandular..*A. farnesiana*
               8. Pods twisted; petiole eglandular.. .. ..*A. platyfrons*

            7. Pods flat :
               9. Small trees with fowl smelling flowers; pods longitudinally nerved.— .. .. ..*A. eburnea*
               9. Bushy shrubs; flowers fragrant; pods horizontally or reticulately nerved.....*A. jacquemontii*
      5. Heads in terminal panicles. .. .. .*A. leucophloea*
   2. Flowers in spikes :
      10. Pinnae 10–20 pairs; bark white or ash-coloured .. .. *A. polyacantha*
      10. Pinnae 20–40 pairs; bark dark-brown .. .. *chundra*
      10. Pinnae 3–5 pairs; bark ash-coloured dark-brown or nearly black :
         11. Spines in pairs; leaves 5–12 cm long; rachis glabrous; bark dark-brown or nearly black .. .. *A. ferruginea*
         11. Spines ternate; leaves 2–5 cm long; rachis pubescent; bark ash-coloured.. .. .. *A. senegal*

Acacia chundra (Roxb. ex Rottl.) Willd. Sp. Pl. 4:1078. 1806; S & J 21; S 84. *Mimosa chundra* Roxb. ex Rottl. in Ges. Naturf. Fr. Neue Schr. 4:207. 1803. *Mimosa sundra* Roxb. Pl. Cor. 3: t. 225. 1819. *Acacia sundra* (Roxb.) DC. Prodr. 2:458. 1825; FBI 2:295; WI 1:20. *Acacia catechu* Willd. var. *sundra* (DC.) Prain in Journ. As. Soc. Bengal 66:508. 1898; G 1:476; WI 1:9.

6–13 m tall, armed trees, with light-black, rough bark. Leaves 10–20 cm long; pinnae 2.5–5 cm long; leaflets 30–60 pairs, 0.4–0.6 cm long, imbricating, linear-oblong. Flowers creamy-white, in 6–14 cm long, axillary spikes. Pods 6–10 × 1.8–2.3 cm, lanceolate, glabrous, pale-to dark-brown, reticulate, apiculate. Seeds ellipsoid-oblong, smooth, glabrous, brown.

Throughout, in deciduous forests, common; sparingly seen in scrub forests. (KAIR, KHAIR)

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Acacia eburnea (L. f.) Willd. Sp. Pl. 4:1081. 1806; FBI 2:293; C 1:474. *Mimosa eburnea* L. f. Suppl. 437. 1781.

Small trees, with young branches purplish-brown. Leaves 1.8–2 cm long; pinnae pairs 2–7, 0.6–1.5 cm long; leaflets 6–8 pairs, 0.2–0.4 cm long, linear-oblong, glabrous. Heads yellow, 0.8–1.2 cm across, axillary. Pods 8–20×0.6–1.2 cm, slightly curved, glabrous 6–10-seeded.

Reported by Thaker J. I. (1926) from Kutch; according to him it grows throughout Kutch in hilly tracts.

FLS : Nov.–Feb. *FRS :* Jan.–Mar.

Acacia farnesiana (L.) Willd. Sp. Pl. 4:1083. 1806; FBI 2:292; C 1:473; WI 1:14; Bailey 590; S & J 21. *Mimosa farnesiana* L. Sp. Pl. 521. 1753.

Shrubs or small trees, armed. Leaves 2.5–6 cm long, bipinnate; pinnae 4–8 pairs, 1.5–2.5 cm long; leaflets 10–20 pairs, 0.4–0.6×0.1–0.2 cm, linear-oblong, glabrous or thinly pubescent. Heads yellow, 0.6–1 cm across, fragrant. Pods 5–8 cm long, subcylindric, black, striate, glabrous.

Planted for fragrant flowers; so far reported from Kutch, Saurashtra, Vallabh Vidyanagar, Bulsar; native of South America. (TALBAVAL)

FLS & FRS : Aug.–Mar.

Acacia ferruginea DC. Prodr. 2:458. 1825; FBI 2:295; C 1:477; WI 1:14; S & J 21.

5–15 m tall trees with rough bark, excorticating into rectangular scales. Pinnae 3–6 pairs, 2–7 cm long; leaflets 10–20 pairs, 0.3–1×0.1–0.2 cm linear-oblong, glabrous, rounded at ends. Flowers creamy-white, in 6–10 cm long, axillary spikes. Pods 7.5–15×1.8–3 cm, flat, brown, glabrous, reticulate. Seeds 4–8.

Dangs, Vyara, Songadh, Chhotaudepur, Panchmahals, north Gujarat (Modasa), Saurashtra and Kutch; not common. (KANTI, ITCHAN, KHAIGAR).

FLS : Apr.–Sep. *FRS :* May–Oct.

Acacia jacquemontii Bth. in Hk. f. Lond. Journ. Bot. 1:499. 1842; FBI 2:293; C 1:475; WI 1:15; S & J 21.

1.5–3 m tall, armed shrubs. Leaves 2–4.5 cm long; pinnae 2–4 pairs, 8–10 cm long; leaflets ± 0.2×0.1 cm, linear-oblong, glabrous. Heads yellow, 0.4–0.6 cm across, axillary, solitary or fascicled, pedunculate. Pods 6–8×1.2–1.6 cm, flat, straight, glabrous.

Baroda, Panchmahals, north Gujarat, Saurashtra and Kutch; not common. (RATOBAVAL)

FLS : Dec.–May *FRS :* Feb.–June

Acacia leucophloea (Roxb) Willd. Sp. Pl. 4:1083. 1806; FBI 2:294; C 1:475; WI 1:15. Pl. 4(4); Ch & O 96; S & J 21. *Mimosa leucophloea* Roxb. Pl. Cor. 2:27. t. 150. 1800.

5–7 m tall trees, with greyish-white and smooth bark in younger parts and blackish-brown and rough bark excorticating in irregular scales in older. Leaves bipinnate, 2.5–4.5, cm long; pinnae 4–10 pairs, 1.5–2.5 cm long; leaflets 12–30 pairs, 0.2–0.5 cm long, linear-oblong, glabrous. Heads creamy-to pale-yellow, in 10–40 cm long, terminal panicles. Pods 10–17×0.5–0.8 cm, flat, linear-oblong, yellowish-brown, tomentose. Seeds 0.4–0.5 cm across, spherical, smooth, pale-brown.

Throughout in plains. (HERMOBAVAL, HIVER, SAMADI)

FLS: June–Nov. *FRS*: July–Jan. sometimes upto May.

Acacia nilotica (L.) Del. subsp. **indica** (Bth.) Brenan in Kew Bull. 1957 : 84. 1957; S 83. *Acacia arabica* (Lam.) Willd. var. *indica* Bth. in Hk. Lond. Journ. Bot. 1:500. 1842. *Acacia arabica* auct. non (Lam.) Willd; FBI 2:293; C 1:472; WI 1:5. Pl. 5(1). *Acacia nilotica* (L.) Del. Fl. Aegypt. Ill. 79. 1813; Ch & O 95; S & J 21.

3–8 m tall, straight or crooked, armed trees, with dark-blackish-brown, irregularly, longitudinally fissurred bark. Leaves

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2-4.5 cm long; pinnae 4-8 pairs; leaflets 10-25 pairs, minute, linear-oblong, glabrous. Heads yellow, in axillary panicles. Pods 8-12×1-1.5 cm, linear-oblong, glaucous-green, jointed, joints nearly orbicular, compressed, minutely hairy. Seeds brownish-black, oblong, compressed, smooth, glabrous.

Throughout in plains; more common in arid and semi arid regions. (BAVAL, KALO BAVAL, RAM BAVAL)

FLS : July-Oct. *FRS* : Aug.-Dec.

Acacia pennata (L.) Willd. Sp. Pl. 4:1090. 1806; FBI 2:297; C 1:480; Ch & O 96; WI 1:19; S & J 21; S 85. *Mimosa pennata* L. Sp. Pl. 507. 1753 (excl. syn.).

Heavily armed lianas, with pale-to dark-brown, glabrous, polished bark. Leaves 2-pinnate, 10-20 cm long; pinnae pairs 8-15, 2.5-8 cm long; leaflets 0.4-0.8 cm long, obliquely linear-oblong, sessile. Heads creamy-white, 1-1.5 cm broad, in 15-30 cm long, terminal panicles. Pods 10-17×1.3-3 cm, flat, pale-to dark-brown, glabrous, reticulate. Seeds oblong or nearly spherical, compressed, dark-brown, smooth, glabrous.

Frequent in deciduous forests, sparingly in scrub forests. (CHILLAR, KHERVALIO BAVAL)

FLS : July-Sep. *FRS* : Dec. Mar.

Acacia planifrons Koen. ex W. & A. Prodr. 276. 1834; FBI 2:293; C 1:474; WI 1:19; S & J 22.

Armed trees with umbrella-like crown; bark thick, dark-grey in older parts, purplish in younger. Leaves 2-pinnate; pinnae 3-6 paired, 0.6-1.2 cm long; leaflets 8-10 pairs, 0.2-0.4 cm long, linear-oblong. Heads yellow, 0.6-1 cm across, in axillary fascicles. Pods 4-5×0.6-0.8 cm, turgid, twisted, glabrous.

Saurashtra. (CHHATRO BAVAL, CHHATARIO BAVAL)

FLS : Post-monsoon period.

Acacia polyacantha Willd. Sp. Pl. 4:1079. 1806; Brenan in Kew Bull. 1956:195. 1957; S 84. *Acacia Suma* Buch.-Ham. ex Voigt, Hort. Sub. Calc. 260. 1845; FBI 2:294; C 1:476; WI 1:20.

7.5-16.5 m tall trees. Leaves 15-30 cm long; pinnae 10-30 pairs, 4-10 cm long; leaflets 30-60 pairs, linear-oblong, subcoriaceous, glabrous. Flowers creamy-white, in 7-10 cm long, axillary spikes. Pods 10-14×1.5-2 cm, brown, flat, strap-shape. Seeds 0.7-0.8 cm across, black, ovoid spherical, compressed, flat.

Dangs; occasional. (GOBITA)

FLS : May-July *FRS* : Aug.-Feb.

Acacia senegal (L.) Willd. Sp. Pl. 4:1077. 1806; FBI 2:295; C 1:478; WI 1:19; S & J 22. *Mimosa senegal* L. Sp. Pl. 521. 1753.

2-7 m tall, armed trees. Pinnae 3-5 pairs, 1.5-2 cm long; leaflets 8-15 pairs, 0.2-0.3 cm long, linear, glabrous. Flowers white or creamy-white, in 6-10 cm long, axillary, solitary or 2-3-fascicled spikes. Pods 4-9×1-2 cm, flat, glabrous linear-oblong or lanceolate, reticulate. Seeds 5-6.

Bulsar, Vyara, Surat, Panchmahals, Mahi ravines. Tuwa, north Gujarat, Saurashtra and Kutch; frequent in arid and semi arid regions. (GORADIO BAVAL)

FLS Aug.-Oct. *FRS* : Oct.-Apr.

Acacia sinuata (Lour.) Merr. in Trans. Amer. Phil. Soc. N. S. 24:186. 1935; S & J 21; S 84. *Mimosa sinuata* Lour. Fl. Cochinch. 653. 1790. *M. concinna* Willd. Sp. Pl. 4:1039. 1805. *Acacia concinna* DC. Prodr. 2:464. 1825; FBI 2:296; C 1:479.

A large, climbing shrub, heavily armed; bark pale-brown. polished. Leaves 2-pinnate, 5-10 cm long; pinnae 4-8 pairs, 2.5-6 cm long; leaflets 1-1.2 cm long, linear, glabrous, unequal-sided. Flowers in globose heads forming terminal, lax panicles. Pods 7-12×1.8-2.8 cm, thick, fleshy, somewhat constricted between seeds, 6-10-seeded.

Saurashtra (Girnar). (CHIKAKAI)

FLS : Aug.-Oct. *FRS* : Oct.-Nov.

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Acacia torta (Roxb.) Craib in Kew Bull. 1915:410. 1915; S 85. *Mimosa torta* Roxb. Fl. Ind. 2:566. 1832. *Acacia caesia* W. & A. Prodr. 278. 1834. *Acacia intsia* auct. non Willd. 1806; FBI 2:397; C 1:479; WI 1:9.

An extensive, heavily prickly liana, with dark-brown and somewhat polished bark. Leaves bipinnate, 8–12 cm long; pinnae pairs 2–6, 5–6 cm long; leaflets 0.2–1 × 0.1–0.6 cm, linear-oblong, glabrous but for ciliate margins. Heads creamy-yellow, 0.4–0.8 cm broad, in 30–50 cm long, terminal panicles. Pods 8–10 × 1–1.5 cm, pale-to dark-brown, flat, linear, apiculate.

Chhotaudepur, Ankleshwar, Baroda, Vallabh Vidyanagar, north Gujarat, on hedges; not common.

FLS : Oct.–Jan. *FRS* : Nov.–Feb.

ADENANTHERA L.

Adenanthera pavonina L. Sp. Pl. 384. 1753; FBI 2:287; C 1:466; WI 1:31. Pl. (3); S & J 22.

7–15 m tall trees. Leaves 15–20 cm long; pinnae 2–6 pairs, 10–15 cm long; leaflets 2–4.5 × 1.5–2.5 cm, elliptic-oblong, glabrous. Flowers yellow, subsessile, in 10–25 cm long, terminal and axillary racemes. Pods 15–25 cm long, dark-brown or blackish -brown, 8–15 cm long.

Sometimes planted in gardens.(RATANJALI; RATANGUNJ)

FLS : Mar.–June *FRS* : May–Aug., sometimes throughout the year on trees.

ALBIZIA Durazz

Key to species

1. Pinnae 2–4 (–6) pairs; leaflets more than 1 cm long :
   2. Bark black; pinnae 2–3(–4) pairs; flowers stalked, in 3.5–5.5 cm broad head; calyx 0.3–0.4 cm long; pods 15–30 × 3–5.2 cm.. .. ..*A. lebbeck*

   2. Bark grey or ash-coloured; pinnae 2–6 pairs; flowers sessile, in not more than 2.5 cm broad head; calyx less than 0.3 cm long; pods 10–20 × 1.3–3.5 cm :
      3. Calyx and rachis pubescent; pods 2.5–3.5 cm broad.. .. ..*A. loratissima*
      3. Calyx and rachis glabrous; pods 1.3–2.2 cm broad... .. ..*A. procera*
1. Pinnae 6–20 pairs; leaflets not more than 1 cm long.. .. ..*A. amara*

Albizia amara Boivin var. **amara**; Brenan Fl. Trop. East Afr. (Mimosaceae) 151. 1959. *Albizia amara* Boivin in Encycl. du xix Siecle 2:34; Bth. in Hk. Lond. Journ. Bot. 3:90. 1844; FBI 2:301; C 1:483; WI 1:42.

6–8 m tall trees, with light-blackish-brown, rough bark. Leaves 2–5 cm long; leaflets 7–20 pairs, linear-oblong, glabrous but for ciliate margins. Heads creamy-white to pale-yellow, 1–1.5 cm across, solitary or 2–3-fascicled in upper axils. Pods 8–20 × 2–3.5 cm, flat, linear-oblong, glabrous, pale-brown or nearly straw-coloured, faintly reticulate, subacute at ends. Seeds nearly spherical or slightly cuneate, smooth, glabrous.

Rajpipla (Gora-Kevadia range); a few trees seen.

FLS : May-July *FRS* : Aug -Jan.

Albizia lebbeck (L.) Bth. in Hk. Lond. Journ. Bot. 3:87. 1844; FBI 2:298; C 1:481; WI 1:43. Pl. 9(2); S & J 22. *Mimosa lebbeck* L. Sp. Pl. 516. 1753.

— 8–20 m tall trees. Leaves 8–15 cm long; leaflets 1–5 × 0.8–2.2 cm, subsessile, elliptic-oblong or obovate, coriaceous, pubescent beneath. Heads solitary or 2–3-fascicled in upper axils. Pods oblong or elliptic-oblong, glabrous, much compressed, slightly tumid and reticulate above seeds. Seeds 4–12, spherical or slightly reniform, smooth, glabrous, yellowish-brown

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Throughout in deciduous forests, sparingly seen in scrub forests; not common; also planted as an avenue tree. (KALO-SARAS, SIRIS, MOTI, HARADI)

FLS : July–Oct. *FRS* : Oct.–Mar. Flowers often fall off on the ground before fertilization.

Albizia odoratissima (L. f.) Bth. in Hk. Lond. Journ. Bot. 3:88. 1844; FBI 2:299; C 1:482; WI 1:44; Ch & O 97; S & J 22. *Mimosa odoratissima* L. f. Suppl. 437. 1781.

15–20 m tall trees. Leaves 7–22 cm long; leaflets 8–15 pairs, 1.5–3×0.5–1.4 cm, elliptic-oblong, glabrous, subcoriaceous. Heads globose in 10–15 cm long, terminal panicles. Pods brown, flat, straight, smooth, reticulate above seeds. Seeds spherical or nearly so, compressed, smooth, glabrous, yellow or yellowish-brown.

In deciduous forests, occasional, sparingly in scrub forests. (DHOLOSARAS, ACHHO SARASDO, DHOLO SIRISH)

FLS : Apr.–June *FRS* : June–Nov.

Albizia procera (Roxb.) Bth. in Hk. Lond. Journ. Bot. 3:89. 1844; FBI 2:299; C 1:482; WI 1:44; S 86. *Mimosa procera* Roxb. 2:12. t. 121. 1798.

15–20 m tall trees. Leaves 12–22 cm long; leaflets 6–12 pairs, 0.7–4×0.5–2.5 cm, ovate-oblong or elliptic-oblong, coriaceous, grey-pubescent beneath (at least when young). Heads 1.5–2 cm across. Pods and seeds as in previous species.

In deciduous forests, less frequent than the previous species.

FLS & FRS : Oct.

DICHROSTACHYS (DC.) W. & A. nom. cons.

Dichrostachys cinerea (L.) W. & A. Prodr. 271. 1834; FBI 2:298; C 1:468; WI 2:56. f. 25; Ch & O 95; S & J 22. *Mimosa cinerea* L. Sp. Pl. 520. 1753.

Thorny shrubs, 2–6 m tall, with grey or greyish-white, longitudinally fissurred bark. Leaves bipinnate, 1.5–4.5 cm long; leaflets 10–20 pairs, 0.2–0.5×0.1–0.2 cm, sessile, opposite, narrowly linear-oblong, appressed-hairy beneath. Spikes 3–7 cm long, axillary or extra-axillary. Pods 3.5–5.5 cm long, compressed, linear-falcate, twisted, when mature dark-brown, pubescent. Seeds oblong, reddish-brown, smooth, glabrous.

Throughout, in arid and semi-arid zones. (MOR DHUN-DHIYU).

FLS & FRS : July–Dec. Fruits often for the whole year.

LEUCAENA Bth.

Leucaena leucocephala (Lam.) de Wit in Taxon 10:54. 1961; S & J 22. *Mimosa glauca* L. Sp. Pl. (ed. 2) 1504. 1763 non L. 1753. *Mimosa leucocephala* Lam. Encycl. Meth. Bot. 1:12. 1783. *Leucaena glauca* Bth. in Hk. Lond. Journ. Bot. 4:416. 1842; FBI 2:290; C 1:469; WI 6:77. f. 34.

3.5–8 m tall trees or large shrubs. Leaves 8–17 cm long, 2-pinnate; pinnae 3–8 pairs; leaflets 10–20 pairs, 0.5–1.5×0.2–0.3 cm, membranous, linear-oblong, glabrous, sparsely hairy beneath. Heads 1.5–2.5 cm across. Pods 7.5–17×1–2 cm, flat, glabrous, linear-oblong, strap-shaped, pale-to dark-brown.

Planted at some places, seldom an escape; native of America. (PARDESI BAVAL, LISOBAVAL, VILAYTI BAVAL)

FLS : May–Nov. *FRS* : May–Feb.

MIMOSA L.

Key to species

1. Prostrate of suberect; leaves 1–2-pinnate; stamens 4; pods 0.8–2.5×0.3–0.5 cm, 3–5-jointed .. .. .. *M. pudica*
1. Erect or straggling; leaves more than 2-pinnate; stamens 8; pods more than 2.5×0.5 cm, 4–10-jointed :
   2. Pods glabrous; sutures not prickly .. .. *M. rubicaulis*
   2. Pods pubescent; sutures prickly .. .. *M. hamata*

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Mimosa hamata Willd. Sp. Pl. 4:1033. 1805; FBI 2:291; C 1:471; WI 6:381. f. 146; S & J 22.

0.5–2 m tall undershrubs, with cinnamon-barown bark. Leaves bipinnate, 4–6 cm long; pinnae 3–6 pairs, 1.5–2 cm long. Leaflets 6–10 pairs, 0.4–0.6 cm long, ovate-oblong, somewhat hairy beneath. Heads globose, axillary, solitary and in short, terminal racemes. Pods flat, strongly falcate, reddish-brown, nearly glabrous. Seeds light-reddish-brown, ellipsoidal, glabrous, smooth.

Throughout in plains from Surat to Kutch; common in arid and semi arid zones. (KASI, KAIBAVAL)

FLS & FRS : Aug.-Jan.

Mimosa pudica L. Sp. Pl. 518. 1753; FBI 2:291; C 1:470; WI 6:382; S 83.

Softly hairy and heavily armed, prostrate, diffuse or suberect herbs or undershrubs. Leaves digitate; pinnae 2 pairs, 4–8 cm long; leaflets 8–20 pairs, 0.6–1.2 cm long, linear-oblong, hairy beneath. Heads axillary, solitary and in short, terminal racemes. Pods compressed, somewhat falcate, dark-brown, hispid.

Planted at some places in gardens as ornamental; also an escape. (LAJJAVANTI, LAJAMANI, LAJJALU).

FLS & FRS: Throught the year.

Mimosa rubicaulis Lam. Encyc. Meth. 1:20. 1783; FBI 2:291; C 1:471; Blatter & McCann in Journ. Bombay nat. Hist. Soc. 17:170. 1908.

Straggling, prickly shrubs. Leaves 2-pinnate 10–15 cm long: pinnae 5–11 pairs. Leaflets 8–15 pairs, 0.6–0.8×0.2–0.3 cm, linear-oblong, glabrous above, slightly pubescent beneath. Heads globose, crowded at ends of branchlets. Pods 7–10×1–1.5 cm, flat, glabrous, joints 4–10, one-seeded.

Listed by Blatter from Kutch.

FLS & FRS : Sept.-Nov.

NEPTUNIA Lour.

Key to species

1. Annual, aquatic .. .. *N. oleracea*
1. Perennial, terrestrial .. .. *N. triquetra*

Neptunia oleracea Lour. Fl. Cochinch. 654. 1790; FBI 2:285; C 1:463; WI 7:15. f. 9. *Mimosa prostrata* Lam. Encycl. 1:10. 1783 (excl *M. natans* L. f., nom. illeg.) *Neptunia prostrata* Baill. in Bull. Soc. Linn. Paris 1:356. 1883.

Floating herbs. Leaves bipinnate; pinnae 2–3 pairs, 3–5.5 cm long; leaflets 8–15 pairs, 0.2–0.5×0.1–0.3 cm, narrowly oblong, glabrous. Heads yellow, 3–5 cm long, axillary. Pods 1.5–2.5×0.7–1.1 cm, flat, oblong, reddish-brown, 6–8-seeded.

In temporary ponds and ditches; not common. (LAJALU, PANILAJALU)

FLS & FRS: Aug.-Dec.

Neptunia triquetra Bth. in Hk. Lond. Journ. Bot. 4:355. 1842; FBI 2:286; C 1:464; S & J 22: WI 7:15.

Diffuse or suberect, glabrous herbs. somewhat woody at base. Leaves 2.5–5 cm long, abruptly 2-pinnate; pinnae 3 pairs; leaflets 7–20 pairs, sessile, glabrous, elliptic-oblong. Heads yellow, 1–1.5 cm long, solitary, axillary. Pods 1.5–2.5×0.6–0.8 cm, elliptic-oblong, flat, acute at ends, dark-brown or blackish-brown. Seeds 4–6 (1–2), oblong or obovate-oblong, compressed, dark-brown, shining, glabrous, smooth.

Throughout, among grasses in plains (except Kutch); not common.

FLS: May-Sep. *FRS* : Aug.-Nov.

PITHECELLOBIUM C. F. P. Mart. nom. cons.

Pithecellobium dulce (Roxb.) Bth. in Hk. Lond. Journ. Bot. 3:199. 1844; FBI 2:302; C 1:485; Bailey 193; Ch & O 97; S & J 22; S 86; WI 8:140. f. 47 *Mimosa dulcis* Roxb. Pl. Cor. 1:67. t. 99. 1795.

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An armed tree, 5-10 m tall; bark greyish-black, rough, longitudinally fissurred. Leaves bipinnate; leaflets 1.5–3.1×0.8–2.1 cm, ovate-oblong, coriaceous, glabrous. Heads 0.4–0.8 cm across, in 6–20 cm long, terminal and axillary panicles. Pods 3–15×0.8–1 cm, torulose, spirally twisted. Seeds black, polished, compressed, broadly ovate, covered by red or dirty-green aril.

Throughout, in hedges, along railway lines and road sides; native of Mexico. (GORASAMLI VILAYTI AMLI)

FLS : Nov.–Apr. *FRS :* Dec.–June

PROSOPIS L.

Key to species

1. Pinnae pairs 1–2; pods 5–20 cm long :
   2. Trees with pendent, seldom scandent, dark-green, smooth branches; leaflets 10–20 pairs; pods compressed . . *P. juliflora*
   2. Trees with compact branches; branches rough, not dark-green; leaflets 7–12 pairs; pods cylindric .. *P. cineraria*
1. Pinnae pairs 3–5; pods 1.5–2 cm long .. .. *P. stephaniana*

Prosopis cineraria (L.) Druce in Rep. Bot. Exch. Cl. Brit. Isles 3:422. 1914; S & J 22; WI 8:247. *Mimosa cineraria* L. Sp. Pl. 517. 1753. *Prosopis spicigera* L. Mant. 1:68. 1767; FBI 2:288; C 1:467.

An armed tree, 5–10 m tall, with rough, yellowish- or greyish-brown bark. Leaves bipinnate, 3–3.5 cm long; leaflets 0.6–1.2×0.3–0.5 cm, oblong, appressed-hairy. Flowers yellow, in 4–9 cm long, slender, axillary, simple or branched spikes. Pods 5–15 cm long, pendent, subtorulose, glabrous. Seeds ovoid-oblong, subcompressed, shining, wrinkled.

Throughout in plains, quite frequent in scrub forests. (KHIJADO, SHAMI)

FLS & FRS : Oct.–June.

Prosopis juliflora (Sw.) DC. Prodr. 2:447. 1825; S & J 22. *Mimosa juliflora* Sw. Prodr. 85. 1788.

Armed shrubs or small trees. Leaves bipinnate; pinnae 4–6 cm long; leaflets 0.4–1.2×0.2–0.3 cm, sessile, oblong, glabrous. Flowers yellow, in 2–8 cm long, axillary, pendent spikes. Pods 10–15×0.9–1.2 cm, pendent, slightly curved.

Throughout, planted along coastal region for soil reclaimation; now naturalized in many parts; native of Mexico and Central America.

FLS & FRS : Aug.–May.

Prosopis stephaniana Kunth in Spr. Syst. 2:236. 1825; FBI 2:288; C 1:468; WI 8:248.

Large shrubs or small trees, hairy in younger parts. Leaves 2.5–5 cm long; leaflets 8–12 pairs, 0.3–0.6×0.1–0.2 cm, sessile, obliquely oblong, thinly pubescent beneath. Flowers in axillary, 4–6 cm long spikes. Pods 1.8–3×1–1.8 cm, oblong, black.

Reported by Cooke from Saurashtra (Gogha), and by Thaker J. I. (1926) from Kutch. (PATKANDI, BETHI-KHIJADI)

SAMANEA Merr.

Samanea saman (Jacq.) Merrill in Journ. Wash. Acad. Sci. 6:47. 1916; Bailey 593; S & J 22. *Mimosa saman* Jacq. 15. t. 19. 1809. *Pithecolobium saman* Bth. in Hk. Lond. Journ. Bot. 8:216. 1844; C 1:485.

10–15 m tall trees, with light-black or blackish-brown, irregularly fissurred bark. Leaves 8–24 cm long; pinnae pairs 4–6, 4–15 cm long; leaflets 3–8-paired, 0.7–7 x 0.5–4 cm, elliptic-rhomboid or obovate-oblong, glabrous above, pubescent beneath. Heads 2–4 cm broad. Pods 14–21 x 2–2.4 cm, black, pendent, somewhat pulpy, septate between seeds.

Planted along roads and in gardens; native of tropical America. (RATOSARASDO)

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ROSACEAE 46

POTENTILLA L.

Potentilla supina L. Sp. Pl. 497. 1753; FBI 2:359; C 1:490; WI 8:224.

A prostrate or procumbent, hairy herb, 15–20 cm long. Leaves trifoliolate, petiolate; leaflets 0.5–1 × 0.3–0.5 cm, obovate, sharply serrate, hairy. Flowers yellow, 0.4–0.5 cm across, axillary, solitary. Achenes minute, brown, trigonous, rounded and faintly 3–5–ribbed on back.

In moist river beds of Narmada and along margins of ponds at Pavagadh; occasional.

FLS & FRS : Dec.–Apr.

VAHLIACEAE —47

VAHLIA Thunb. nom. cons.

Vahlia digyna (Retz.) O. Ktze. Rev. Gen. Pl. 3:227. 1891; Ch & O 97; S & J 22; S 87. *Oldenlandia digyna* Retz. Obs. 4:23. 1786. *Vahlia viscosa* Roxb. Hort. Beng. 86. 1814 (nomen) & Fl. Ind. 2:89. 1832; FBI 2:399; C 1:493.

Annuals, erect, 15–25 cm tall, glandular–pubescent. Leaves 0.8–4.5 × 0.3–1.2 cm, linear–lanceolate, glabrescent. Flowers yellow, axillary, solitary or geminate. Capsule 0.2–0.4 cm long, ellipsoid –oblong or nearly globose, glandular–hairy. Seeds numerous, brown, oblong.

Throughout (except Kutch), a weed in cultivated fields and drying moist ground; not common. (PILO AGIO)

FLS & FRS : Sep.–Jan.

HALORAGACEAE —48—

MYRIOPHYLLUM L.

Myriophyllum intermedium DC. Prodr. 3:69. 1828; FBI 2:433; C 1:500.

Aquatic, free floating, glabrous herbs. Leaves 1.2–3 cm long, alternate or ternate, submerged ones pinnatisect, floating, linear, entire or subserrate. Flowers white, axillary, in short spikes. Fruits 4–furrowed, separating into 4–2 ripe carpels.

Reported by Blatter (1908) and Thaker J. I. (1926) from Kutch; also from Dharampur, rare.

RHIZOPHORACEAE — 49

Key to species

1. Calyx 4–lobed; stamens 8–12 .. .. .. *Rhizophora*
1. Calyx 8–14 lobed; stamens 16–28; .. .. .. *Bruguiera*
1. Calyx 5–6–lobed; stamens 10–12 .. .. *Ceriops*

BRUGUIERA Lam.

Bruguiera gymnorhiza (L.) Lam. Tab. Encycl. 2:517. 1793; FBI 2:437; C 1:504; S & J 22. *Rhizophora gymnorhiza* L. Sp. Pl. 443. 1753.

Evergreen, large shrubs or small trees. Leaves 7–14×3–6 cm, elliptic or elliptic–oblong, glabrous. Flowers axillary, solitary. Fruit 2–2.5 cm long, obconical, crowned with persistent calyx lobes.

In sea creek at Navlakhi in Saurashtra (Santapau, 1962). (SANVAR)

FLS : Jan.–Apr. *FRS* : Feb.–June.

CERIOPS Arn.

Ceriops tagal (Perr.) C. B. Rob. in Phil. Journ. Sci. 3:306. 1908. *Rhizophora tagal* Perr. in Mem. Soc. Linn. 3:138. 1825. *Ceriops candolleana* Arn. in Ann. Nat. Hist. 1:364. 1838; FBI 2:436; C 1:503.

Erect shrubs, 75–90 cm tall, with fawn–coloured, smooth, lenticellate bark. Leaves 5–8.5×1.3–4 cm, obovate–oblong or

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spathulate, opposite, glabrous, thick, fleshy, petiolate. Flowers white, almost sessile, axillary, in clustered cymes. Fruit 1.5–1.8 cm long, ovoid, on persistent, thick and fleshy sepals.

Listed by Rao R. S. (1979) from Kutch

FLS & FRS : July.

RHIZOPHORA L.

Rhizophora mucronata Lam. Encycl. Meth. Bot. 6:189. 1804; FBI 2:435; C 1:501; WI 9:9. f. 7.

An evergreen, large shrub or a small tree; bark smooth, brown, young branches with annular marks. Leaves 8–15 × 3.7–7.1 cm, elliptic–oblong or elliptic–lanceolate, glabrous, nigro–punctate beneath. Flowers creamy–white, subsessile, in pendunculate cymes. Fruit–3–3.5 cm long, ovoid–conical, crowned by persistent calyx lobes.

Along sea coast near Bulsar, Saurashtra and Kutch. (KAROD)

FLS & FRS : Aug.–Dec.

COMBRETACEAE — 50

Key to genera

1. Petals absent :
   2. Scandent shrubs; calyx lobes persistent, enlarged in fruit .. .. *Calycopteris*
   2. Erect trees or shrubs; calyx caducous :
      3. Inflorescence simple or branched spikes.... *Terminalia*
      3. Inflorescence a globose head.. .. .. *Anogeissus*
1. Petals 4–5:
   4. Calyx tube very short.. ... . *Combretum*
   4. Calyx tube very long, upto 2–3 cm long.. .. *Quisqualis*

ANOGEISSUS Wall.

Key to species

1. Branches drooping or spreading; leaves 1.2–6 × 1–4 cm, appressed-hairy, at least beneath, membranous; ultimate branches appressed-pubescent :
   2. Beak of fruit as long as or longer than its nucleus .. .. *A. sericea*
   2. Beak of fruit shorter than its nucleus.. .. .. *A. pendula*
1. Branches not as above; leaves 3.5–14 × 2–8.5 cm, glabrous, coriaceous; ultimate branches glabrous.. .. .. *A. latifolia*

Anogeissus latifolia (Roxb.) Wall. ex Bedd. Fl. Sylv. t. 15. 1869; FBI 2:450; C 1:512; WI 1:81. Pl. 9(3) & 15(1); Bor 214; Ch & O 98; S & J 22; S 91. *Coronopus latifolia* Roxb. Hort. Beng. 34. 1814 (nomen) & Fl. Ind. 2:442. 1832.

10-24 m tall trees, with greyish–white or ash–coloured, smooth bark, peeling off in scales. Leaves 3.5–14 × 2–8.5 cm, ovate, ovate–oblong, elliptic–oblong or obovate, glabrous, coriaceous. Flowers yellow, in 0.4–0.8 cm across, axillary, pedunculate heads. Fruits 0.4–0.7 cm across, orbicular, swollen above seed, 2–winged, glabrous, beaked. Seeds pale–brown, ellipsoid, glabrous.

Throughout in deciduous forests, common; in scrub forests not frequent. (DHAVDO, DHAMOD).

FLS & FRS : Sep.–Dec.

Anogeissus pendula Edgew. in Journ. As. Soc. Bengal 21:171. 1853; FBI 2:451; C 1:513; WI 1:82; Bor 214.

Deciduous trees, 3–5 m tall. Leaves elliptic–obovate, subsessile. Heads yellow, in 0.4–0.6 cm across, axillary, pedunculate, globose. Fruits subquadrate, ultimately glabrous.

North Gujarat (Deesa, Modasa, Idar, Pahada), not common. (DHAO, DHANKRA)

FLS : May–Sep. *FRS* : June–Jan.

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Anogeissus sericea Brandis in Indian For. 25:287. 1900; C 1:513; Bor 214.

Small trees or large shrubs, with whitish-brown, fissurred bark. Leaves elliptic or oblong, shortly petiolate. Heads yellow, axillary, 0.7–1.5 cm across, globose. Fruits golden-brown, broadly trapezoidal.

Pavagadh, Panchmahals, north Gujarat; on the whole not common. (DHAO, DHANKRA)

FLS & FRS : Dec.–Apr.

CALYCOPTERIS Lam.

Calycopteris floribunda (Roxb.) Lam. Tabl. Encycl. 2:485. t. 357. 1793; FBI 2:449; C 1:512; S & J 22; S 91. *Getonia floribunda* Roxb. Pl. Cor. 1:61. t. 87. 1795.

Deciduous, scandent shrubs with dark-brown, smooth bark, young branches rufous-pubescent. Leaves 2.5–12.5×1.5–7.5 cm, elliptic-ovate or elliptic-oblong, opposite, rarely ternate, rufous-pubescent and orange or red glandular-punctate beneath. Flowers greenish-white or creamy-white, in terminal panicles. Fruits 0.6–0.8 cm long, oblong or ellipsoid, 5-ribbed, pubescent or tomentose.

Saurashtra (Girnar, Junagadh) and Sanjan forests in south Gujarat; common. (BUKSHI, UKSHI, BUGVEL)

FLS : Feb.–June *FRS :* Mar.–June

COMBRETUM Loefl. nom. cons.

Key to species

1. Flowers red .. .. *C. coccineum*
1. Flowers yellow .. .. *C. ovalifolium*

Combretum coccineum Lam. Encycl. Meth Bot. 1:735. 1784; C 1:516. *Poivrea coccinea* DC. Prodr. 3:18. 1828; Dalz. & Gibs. Bombay Fl. Suppl. 34. 1861.

Extensive twiner. Leaves 4–12×2–6.5 cm, broadly ovate to ovate-lanceolate, opposite or alternate, dark-green. Flowers numerous, in terminal, secund spikes. Fruits not seen.

In gardens, ornamental.

FLS : Dec.–Jan.

Combretum ovalifolium Roxb. Hort. Beng. 28. 1814 *(nomen)* & Fl. Ind. 2:226. 1832; FBI 2:458; C 1:515; Ch & O 100; S & J 22.

A large, woody, deciduous twiner; bark in older parts light-black, irregularly fissured, peeling off into scales, in younger parts pale-yellowish-brown, smooth. Leaves 3.2–11×2.6–7 cm, broadly ovate, elliptic-oblong or obovate, coriaceous. Flowers 0.2–0.3 cm across, in 3–6.5 cm long, axillary and terminal panicles of spikes, often from old wood. Fruits 1.4–4 cm long, obovate, 4-winged, wings entire or jagged, very faintly veined.

Throughout in the forests; seldom on hedges; common.

FLS : Jan.–Apr. *FRS :* Feb.–May

QUISQUALIS L.

Quisqualis indica L. Sp. Pl. (ed. 2) 556. 1762; FBI 2:459; C 1:517; Bailey 724; Ch & O 100; S & J 23; S 92.

An extensive, woody climber, with smooth, pale-brown, bark. Leaves 1.2–10×0.5–0.8 cm, opposite or subopposite, membranous, elliptic-oblong. Flowers bright-rosy-pink or red, rarely white, in terminal and axillary, drooping spikes.

Ornamental; seldom an escape (Broach). (MADHU MALTI)

FLS : All round the year.

TERMINALIA L. nom. cons.

Key to species

1. Fruits not winged :
   2. Leaves alternate, seldom subopposite, crowded at ends of branches; spike simple :

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3. Leaves obovate, cordate at base; fruit ellipsoidal, slightly compressed from above, glabrous .. *T. catappa*

3. Leaves elliptic, elliptic–obovate, cuneate at base; fruit ellipsoid–oblong or nearly globose, not compressed minutely pubescent .. .. .. *T. bellirica*

2. Leaves opposite, rarely subopposite or alternate but not crowded, at ends of branches; inflorescence a panicle .. .. *T. chebula*

1. Fruit winged :

4. Bark smooth, pale–to sandy–brown or grey; veins of wings curved upwards .. .. .. *T. arjuna*

4. Bark rough, ash–coloured or greyish–black, often tessellately fissurred; veins of wing horizontal .. *T. crenulata*

Terminalia arjuna (Roxb.) W. & A. Prodr. 314. 1834; FBI 2:447; C 1:509; S & J 23. *Pentaptera arjuna* Roxb. Hort. Beng. 34. 1814 (nomen) & Fl. Ind. 2:438. 1832.

15–25 m tall trees, with bark excorticating into large, thin flakes. Leaves 15–25 × 6–7.5 cm, elliptic–oblong, coriaceous, glabrous. Flowers white or creamy–yellow, in panicles. Fruits 3.5–4 cm long, oblong or ovoid–oblong, with entire or serrate wings. Seed linear, glabrous.

Rajpipla, Chhotaudepur, Panchmahals, north Gujarat (Balaram, Ambaji) and Saurashtra; not frequent. (PANISADAD, (ARJUNSADAD)

FLS : Mar.–Apr. *FRS* : May–Nov.

Terminalia bellirica (Gaertn.) Roxb. Pl. Cor. 2:54. t. 198. 1798; FBI 2:445; C 1:508; Ch & O 100; S & J 23; S 89. *Myrobalanus bellirica* Gaertn. Fruct. 2:90. t. 97. 1791.

15–20 m tall trees; bark ash–coloured or greyish–brown, longitudinally fissurred. Leaves 4.5–26 × 2.7–15.5 cm, coriaceous, glabrous, petiolate. Flowers creamy–white or pale–yellow, in axillary, 5–18 cm long spikes. Fruits 1.5–2.5 cm across, brown.

Throughout in deciduous forests; occasional (BEHDA, BEDA).

FLS : Jan.–May *FRS* : Nearly throughout the year.

Terminalia catappa L. Syst. Nat. (ed. 12) 2:674. 1767; FBI 2:444; C 1:511; S & J 23.

5–7 m tall, deciduous trees; bark blackish–brown, longitudinally fissurred. Leaves 5.5–32 × 2.3–18 cm, coriaceous, glabrous. Flowers creamy–white or pale–yellow, fragrant, in 6–20 cm long, axillary, solitary or fascicled spikes. Fruit 3–5.5 × 1.6–2.5 cm, olive–green when fresh, at length brown.

Planted in gardens. (DESHI BADAM, BENGALI BADAM)

FLS & FRS : Throughout the year.

Terminalia chebula Retz. Obs. 5:31. 1798. FBI 2:446; C 1:509; S & J 23; S 90.

9–20 m tall trees; bark dark–brown, longitudinally fissurred, excorticating into small woody scales. Leaves 7.5–15 × 4.4–9.5 cm, ovate–oblong or elliptic–oblong, silky pubescent when young, at length glabrous. Flowers creamy–white or pale–yellow, in terminal panicles. Fruits 2.5–4 × 1.5–2 cm, ellipsoid or ellipsoid–obovate, glabrous, 5–ribbed.

Dangs, Vyara, Vansada, Rajpipla and Saurashtra (Girnar); occasional at Dangs; rare in other places. (HARDE, HIRDA)

FLS : Mar. –May *FRS* : Oct. –Dec.

Terminalia crenulata Roth, Nov. Pl. Sp. 380. 1821; Ch & O 99; S & J 23. *Pentaptera crenulata* Roxb. Hort. Beng. 34.1814 (nomen) & Fl. Ind. 2:438. 1832. *Terminalia tomentosa* W. & A. var. *crenulata* Cl. in Hk. f. FBI 2:447. 1878. *Terminalia tomentosa* Cooke, Fl. Pres. Bombay 1:499. 1902 & 1:510. 1958 (non W. & A. 1834).

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15-20 m tall trees, with bark excorticating in rectangular flakes. Leaves 5–21×2.5–7.5 cm, coriaceous, elliptic-lanceolate or elliptic-oblong, petiolate. Flowers white or pale-creamy-yellow, in 10–15 cm long, terminal and axillary paniculate cymes. Fruits 3-4.5×3-5.5 cm, oblong, 5-winged, glabrous.

In deciduous forests; common. (SADAD)

FLS: Feb.–May. *FRS*: Apr.–Dec. often throughout the year.

MYRTACEAE

Key to genera

1. Leaves opposite, seldom alternate; calyx and corolla lobes free:
   2. Flowers less than 1 cm across; inflorescence terminal, axillary or extra-axillary cymes; ovary 2-celled .. .. *Syzygium*
   2. Flowers more than 1 cm across, 1–3, on axillary peduncle; ovary 4–5-celled .. .. *Psidium*
1. Leaves alternate, seldom opposite or subopposite in young parts; calyx and corolloa lobes joined, operculate .. .. *Eucalyptus*

Eucalyptus citriodora Hk. and **E. globulus** Labill. are among the species planted in forests and in gardens.

PSIDIUM L.

Psidium guajava L. Sp. Pl. 470. 1753; FBI 2:468; C 1.529; S & J 23; S 93; WI 8:285. f. 104.

2–4 m tall, large shrubs or small trees; bark greyish-black, rough, longitudinally fissurred, peeling off in irregular flakes. Leaves 3.2–10.5×1.9–6 cm, oblong or elliptic-oblong or obovate, coriaceous, entire, softly hairy beneath. Flowers white or creamy-white. Berries 6-8 cm across, pyriform, fleshy, dark green or sulphur-yellow with white or rosy-purple pulp. Seeds minute, ellipsoidal, smooth, hard, pale-brown.

Cultivated for edible fruits. (JAMPHAL)

FLS & FRS: Nearly all round the year.

SYZYGIUM Gaertn.

Key to species

1. Cymes terminal or from axils of leaves.. .. ..*S. rubicundum*
1. Cymes from axils of fallen leaves :
   2. Leaves 3.5–9.5 cm broad.. .. .. ..*S. cumini*
   2. Leaves 1–4.5 cm broad.. .. .. ..*S. heyneanum*

Syzygium cumini (L.) Skeels in U. S. Dept. Agri. Bur. Pl. Ind. Bull. 248:2. 1912; Ch & O 101; S & J 23; S 92. *Myrtus cumini* L. Sp. Pl. 471. 1753. *Eugenia jambolana* Lam. Encycl. 3:198. 1789; FBI 2:499; C 1:523.

10–15 m tall trees, with ashy-brown, smoothish; calyx tube 6–14 cm long, elliptic-oblong or elliptic-lanceath....*Woodfordia* Flowers 0.4–0.8 cm across, pale-greenish-whit- across, ovate or oblong, glabrous, shining, b Seeds ellipsoidal oblong, white or pinkish,

In forest ccasional; planted along ro- self sown in places. (JAMBU)

FLS ; pr. *FRS* : Mar.–July

Syzygium heyneanum Wall. ex W. & A. Prodr. 1:3 *Eugenia heyneana* Duthie in Hk. f. FBI 2:500. 1878; C 1

2–4.5 m tall shrubs or small trees with smooth, ash-colour bark. Leaves 7–14 cm long, opposite, oblong-lanceolate elliptic -lanceolate, glabrous. Flowers white, on leafless wood. Berries 1–2.5 cm long, oblong or ellipsoidal, pale-purple, glabrous.

In river beds or ravines at Rajpipla, Chhotaudepur, Panchmahals and north Gujarat; not common. (JAL JAMUNI, JAL JAMBU)

FLS : Jan.–Apr. *FRS* : Feb.–May

Syzygium rubicundum W. & A. Prodr. 330. 1834; S & J 23. *Eugenia rubicunda* Wt. Ill. 2:15. 1850; FBI 2:495; C 1:521.

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Listed by Santapau & Janardhanan (1967) from Saurashtra but Santapau (1962) seems to be not sure of the identity of this species as can be judged by his remarks on p. 222. (VAN -JAMBU)

LECYTHIDACEAE -51

CAREYA Roxb.

Careya arborea Roxb. Pl. Cor. 3:4. t. 218. 1819; FBI 2: 511; C 1:528; WI 2:76. f. 35; Bor 207; S 94.

Deciduous trees, 10–18 m tall; bark dark–brown, rough. Leaves 8.5–35.5 × 5.8–16.5 cm, glabrous, obovate or obovate –oblong. Flowers 3–4 cm across, white, in compact racemes at ends of branches. Drupes 3.5–8 cm across, globose, bright–green, fibrous.

In forests of Bulsar, Dangs, Vansda and Vyara; not common. (-KUMBH,- KUMBHI)

FLS : Mar.–May *FRS* : Apr.–June

MELASTOMATACEAE - 52

SONERILA Roxb.

Sonerila tenera Royle, Illus. Bot. Himal. 215. t. 45. f. 2. 1839; FBI 2:530; Chavan & Sabnis in Journ. Bombay nat. Hist. Soc. 61:716. f. 1. 1964; WI 9:431.

Herbs, glandular–pubescent. Leaves opposite, equal or unequal, membranous, ovate, sparsely pubescent, 3–5–nerved. Flowers light–violet. Capsule about 0.9 cm long, triangular. Seeds smooth, ovoid, dark-brown.

Ratanmahals in Panchmahals.

FLS & FRS : Aug.–Oct.

LYTHRACEAE -53

Key to genera

1. Herbs :
   2. Flowers axillary, sessile, solitary or in terminal spikes; capsule 2–4–valved; valves with faint horizontal lines.... .. .. *Rotala*

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2. Flowers in axillary clusters or cymes; capsule circumscissile or irregularly dehiscent; valves without veins.... *Ammannia*

1. Trees or shrubs :

3. Flowers not zygomorphic, white or cream-coloured, sometimes with a pinkish tinge; calyx tube straight; leaves not black-dotted beneath :

4. Flowers hexamerous; petals with crinkled margins; stamens numerous; capsule regularly dehiscent; seeds winged near the apex .. .. *Lagerstroemia*

4. Flowers tetramerous; petals without crinkled margins; stamens eight; capsule irregularly dehiscent; seeds pyramidal, wingless.. .. .. *Lawsonia*

3. Flowers zygomorphic, usually red when fresh; calyx tube bent; leaves minutely black-dotted beneath.... *Woodfordia*

AMMANNIA L.

Key to species

1. Leaves cordate at base, basal lobes auriculate; petals present; style distinct :

2. Cymes distinctly pedicellate; peduncle and pedicels filiform .. .. *A. multiflora*

2. Cymes sessile or subsessile .. .. .. *A. desertorum*

1. Leaves tapering at base seldom basal lobes auricled, but petals and style absent :

3. Cymes distinctly peduncled .. .. .. *A. senegalensis*

3. Cymes sessile or subsessile .. .. .. *A. baccifera*

Ammannia baccifera L. Sp. Pl. (ed. 2) 175. 1762; FBI 2:569; C 1:541; WI 1:68; Ch & O 102; S & J 23; S 97. *Ammannia salicifolia* Hiern in Oliv. Fl. Trop. Afr. 2:278. 1871 non Monti 1767; FBI 2:569; C 1:542.

Annual herbs, 30–75 cm tall. Leaves 0.5–7 × 0.2–1.5 cm, oblong, linear-oblong, linear-lanceolate or narrowly elliptic-lanceolate, glabrous, sessile or subsessile. Flowers red, in dense,

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axillary clusters. Capsules minute, red, glabrous. Seeds minute, brown, obovate.

Throughout in damp places; common, gregarious. (JAL AGIO, LAL AGIO)

FLS & FRS : Throughout the year.

Ammannia desertorum Blatt. & Hallb. in Journ. Bombay nat. Hist. Soc. 26:213. 1918; Santapau, Fl. Saurashtra 1:226. 1962; S & J 23.

Coarse, rigid herbs, 30–50 cm tall; stem and branches 4–gonous, narrowly winged. Leaves 3–7 × 0.4–0.8 cm, lanceolate–with recurved margins, auricled at base. Flowers red, in axillary clusters. Capsule 0.2–0.3 cm long, not covered by persistent calyx. Seeds numerous, irregularly semiglobose, yellowish–brown.

So far reported from Saurashtra, Baroda and Broach; rare.

FLS & FRS : Oct.–Dec.

Ammannia multiflora Roxb. Hort. Beng. 11. 1814. *(nomen)* & Fl. Ind. 1:447. 1820; FBI 2:570; C 1:541; Ch & O 102; S & J 23.

10–30 cm tall, erect, glabrous herbs, with 4–gonous, slightly winged branches. Leaves 0.3–3.6 × 0.2–0.8 cm, sessile, linear to linear-oblong or elliptic–oblong. Flowers minute, red, in axillary cymes. Capsule 0.2–0.4 cm across, globose, glabrous, deep–red. Seeds numerous, minute, red, smooth, hemispherical, excavated on plane surface.

Throughout, in moist ground; common. (ZINO AGIO)

FLS & FRS : Aug.–Jan.

Ammannia senegalensis Lam. Ill. 1:312. t. 77. f. 2. 1791; FBI 2:570; Santapau, Fl. Saurashtra 1:226. 1962 (in key); S 97; Shah & Deshpande in Bull. bot. Surv. India 11:281. 1969.

Erect, glabrous herbs, 15–40 cm tall. Leaves 2–5 × 0.3–0 7 cm, opposite, linear–oblong or lanceolate, glabrous; sessile.

Flowers bright–red or pinkish–red, in axillary much branched, pedunculate cymes. Capsule 0.15–0.3 cm across, globose, red. Seeds minute, yellowish–brown, hemispherical, excavated on one side.

So far found in Saurashtra and Central Gujarat (Tuwa), in moist ground; rare.

FLS & FRS : Oct. –Dec.

LAGERSTROEMIA L.

Key to species

1. Wild plants; leaves usually glaucous beneath; flowers 0.4–1 cm across, white, creamy–white, often with a pinkish tinge; calyx tube smooth :
   2. Calyx tube with a ring inside; calyx lobes adnate to 1.8–4 cm long capsule.. .. .. .. *L. parviflora*
   2. Calyx tube without an inner ring; calyx lobes free and reflexed; capsule 1–2.5 cm long.. .. .. *L. lanceolata*
1. Cultivated plants; leaves not glaucous beneath; flowers more than 1.5 cm across, white, mauve, violet or reddish–purple; calyx tube smooth or ribbed :
   3. 2–5 m tall shrubs or small trees; leaves 1.6–6 × 1.2–3.5 cm, elliptic–oblong or obovate oblong, rarely orbicular; calyx tube smooth; capsule 0.5–1 cm across.... *L. indica*
   3. 9–15 m tall trees; leaves 10–25 × 3–8 cm, oblong–lanceolate or elliptic–lanceolate, prominently reticulately veined; calyx tube 12–14–ribbed; capsule 2–2.5 cm broad.. .. .. *L. speciosa*

Lagerstroemia indica L. Syst. (ed. 10) 1076. 1759. FBI 2:575; C 1:546; Bailey 720; WI 6:20. f. 10.

A small tree or large shrub, 3–6 m tall, with pale–brown, somewhat rough and longitudinally fissurred bark. Leaves elliptic –oblong or obovate, rarely suborbicular. Flowers white or mauve, lilac or bright–reddish–purple, fragrant. Capsule 0.5–1 cm across, smooth, globose. Seeds 0.3–0.4 cm long (including wings), black, smooth, glabrous.

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Ornamental. (CHINAI MENDHI)

FLS : July–Oct. *FRS* : Sep.–Dec.

Lagerstroemia lanceolata Wall. Cat. 2120. 1829 (nomen) ex W. & A. Prodr. 309. 1834 (p. p.); FBI 2:576; C 1:545; WI 6:20. f. 11.

Deciduous trees, 10–25 m tall, with ash-coloured or greyish –brown bark, peeling off in large strips. Leaves 3.5–8×1.2–3.8 cm, ovate–lanceolate or elliptic–lanceolate, greyish–tomentose beneath. Flowers white or creamy–white, with a pinkish–tinge, fragrant. Fruits ellipsoidal, smooth, glabrous. Seeds 0.5–0.8 cm long (including wing), pale–brown, glabrous.

In deciduous forests, along with *L. parviflora* Roxb. but not frequent. (NANA BHONDARA)

FLS : Apr.–July *FRS* : July–Dec.

Lagerstroemia parviflora Roxb. Pl. Cor. 1:47. t. 66. 1795; FBI 2:575; C 1:545; WI 6:22. f. 13; S 100. *Lagerstroemia lanceolata* Dalz. & Gibs. Bombay Fl. 98. 1861 (non Wall. ex W. & A.)

9–18 m tall trees, with smooth, ash–coloured bark, exfoliating in narrow longitudinal flakes. Leaves 3–12×2–6.5 cm, ovate –lanceolate or elliptic–oblong, glabrous. Flowers white, 0.4–0.9 cm across, fragrant. Capsule ovoid or ellipsoid, deep–brown. Seeds winged.

In deciduous forests of South and Central Gujarat; frequent. (BONDARA, BHONDARA, BHONDARO)

FLS : May–Aug. *FRS* : June–Dec.

Lagerstroemia speciosa (L.) Pers. Syn. 2:72. 1807; Bor 322; WI 6:24. f. 15. *Munchausia speciosa* L. Mant. 2:243. 1771. *Lagerstroemia flos–reginae* Retz. Obs. Fasc. 5:25. 1789; FBI 2:577; C 1:546.

Trees with spreading branches and grey or yellowish–grey, smooth bark. Flowers purple or violet–purple, 2–3.5 cm across,

in large, terminal panicles. Capsule 2–4 cm long, ellipsoidal or subglobose, glabrous, smooth. Seeds 1.2–2.5 cm long, including wings.

Ornamental.

FLS : Mar.–June *FRS* : Apr.–Nov.

LAWSONIA L.

Lawsonia inermis L. Sp. Pl. 349. 1753; C 1:544; WI 6:47. Pl. 3; Ch & O 103; S & J 23. *Lawsonia alba* Lam. Encycl. Meth. Bot. 3:106. 1789; FBI 2:573.

Bushy shrubs, 2–3 m tall, with greyish–white, smooth bark. Leaves 1–5.6×0.3–2.2 cm, glabrous, elliptic–lanceolate or ovate –lanceolate, subsessile, glabrous. Flowers white or creamy–white, fragrant, in terminal panicles. Capsule 0.2–0.6 cm across, globose, glabrous, smooth. Seeds minute, brown, smooth, glabrous, trigono–pyramidal.

Planted as a hedge, at times an escape. (MENDHI)

FLS & FRS : Throughout the year.

ROTALA L.

Key to species

1. Leaves opposite; flowers not included in the dilated base of leaf and hidden by herbaceous bracts :
   2. Calyx enclosing the fruit, campanulate, longer than broad, capsule 2–valved; stamens 4 :
      3. Flowers in terminal compact spikes .. *R. serpyllifolia*
      3. Flowers solitary in axils of bracts .. *R. indica*
   2. Calyx not enclosing the fruit, subspherical, as long as broad or broader; capsule 3–valved .. .. *R. densiflora*
1. Leaves ternate; flowers included in the dilated base of leaf and hidden by herbaceous bracts .. .. *R. ocultiflora*

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Rotala densiflora (Roth) Koehne in Bot. Jahrb. 1:164. 1880 & in Pfreich. 17:35 & 33 t. 3C. 1903. *Ammannia densiflora* Roth in R. & S. Syst. 3:304. 1818; *Ammannia pentandra* Roxb. Fl. Ind. 1:448. 1820; FBI 2:568; C 1:539. *Rotala pentandra* (Roxb.) Blatt. & Hallb in Journ. Bombay nat. Hist. Soc. 25:707. 1918.

10-30 cm tall, simple or branched, slender, flaccid, glabrous herbs. Leaves 0.5–1.2 cm long, glabrous, oblong. Flowers red, axillary. Capsule globose, reddish or pinkish, glabrous, smooth. Seeds numerous, subglobose or subellipsoidal, reddish or pale-brown, glabrous.

So far found in water-logged soil at Dharampur and Pavagadh; rare.

FLS & FRS : Sep. Oct.

Rotala indica (Willd.) Koehne in Bot. Jahrb. 1:172. 1880 & Pfreich. 17:40. 1903; Santapau & Shah in Journ. Bombay nat. Hist. Soc. 62 (2): 203. 1965; S 98. *Peplis indica* Willd. Sp. Pl. 2:244. 1799. *Ammannia peploides* Spreng. Syst. 1:444. 1825; FBI 2:566; C 1:538.

Prostrate or suberect herbs, 10–30 cm tall, rooting at lower nodes. Leaves 0.5–2×0.2–0.5 cm, sessile, elliptic or linear-lanceolate; leaves on floriferous branches much reduced and bract-like. Flowers small, bright-pink or red, axillary, solitary, sessile. Capsule minute, ellipsoidal, smooth, glabrous. Seeds very minute, narrowly ellipsoid, glabrous, pale-brown or reddish- brown.

So far a weed in cultivated fields at Dharampur and Dangs; also recorded by Cooke from Chikli and Surat; rare.

FLS & FRS : Sep.-Jan.

Rotala ocultiflora Koehne in Bot. Jahrb. 1:152. 1880 & Pfreich. 17:40. t. 2B. 1903; S & J 23; S 98.

4–10 cm tall, erect herbs. Leaves 0.5–1.2 cm long, narrowly linear, upper or floral leaves rounded and dilated at base, folded along mid-nerve, retuse, bimucronate. Flowers minute, red. Capsule 2–3-valved, ellipsoidal-oblong.

Reported by Santapau (1962) from Saurashtra from moist river beds in Gir forests; gregarious.

FLS & FRS : Oct.

Rotala serpyllifolia (Roth) Bremek. in Acta. Bot. Neerland. 3(1): 149. 1953; S & J 23; S 99. *Micranthus serpyllifolius* Roth, Nov. Pl Sp. 282. 1821. *Ameletia tenuis* Wt. Icon.t. 257. 1840. *Ammannia tenuis* Cl. in Hk. f FBI 2 : 567. 1879; C 1:538. *Rotala tenuis* (Wt.) Koehne in Bot. Jahrb. 1:177. 1880.

A very slender, erect, 10–30 cm tall, glabrous herb. Leaves 0.3–0.6×0.2–0.3 cm, opposite, subsessile, broadly ovate or elliptic, glabrous. Flowers minute, bright-pink or red, in terminal, compact 2–8 cm long spikes. Capsules minute, ellipsoidal, red, glabrous, smooth. Seeds numerous, very minute, narrowly ellipsoidal, brown smooth, glabrous.

Throughout (except Kutch) in stony river bed, gregarious, common; often whole plant pinkish-purple.

FLS & FRS : Oct.-Jan.

WOODFORDIA Salisb.

Woodfordia fruticosa (L.) Kurz in Journ. As. Soc. Bengal 40:56. 1871; Ch & O 103; S & J 23; S 99. *Lythrum fruticosum* L. Sp. Pl. (ed. 2) 641. 1762. *Woodfordia floribunda* Salisb. Parad. Lond. t. 42. 1806; FBI 2:572 (excl. syn. *Grislea uniflora* Rich. & *G. micropetala* Hochst. ex Steud.); C 1:543.

A straggling, deciduous shrub, 1.3–3 m tall, with faintly longitudinally fissured, brown bark. Leaves 1.5–13 x 0.8–4 cm, sessile, broadly lanceolate, hoary - tomentose and nigro-punctate beneath. Flowers 1.5–2.8 cm long, deep-red, axillary or extra-axillary, in fascicled cymes. Capsule 0.5–0.6 cm long, oblong, shining brown. Seeds minute, pale-brown, smooth, narrowly obconical-trigonous, cuneate at base.

Throughout, on rock cuttings and river slopes, rarely in hedges; not common.

FLS & FRS : Jan.-June

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PUNICACEAE

PUNICA L.

Punica granatum L. Sp. Pl. 472. 1753; FBI 2:581; C 1:548; Bailey 721; S & J 24; WI 8:317. Pl. 9 (Col.) & f.119.

A large shurb or a small tree, with cinnamon-brown bark. Leaves 1–5 x 0.4–1.8 cm, oblong-lanceolate or oblong-elliptic, glabrous, subsessile. Flowers bright-red or vermilion red, solitary or in cymes of 2–3. Berries 6–10 cm across, reddish-brown, globose or nearly so, with woody, rough rind. Seeds obtusely angular, white, pink or red juice.

Cultivated at some places; probably a native of Persia, Afghanistan, and Baluchistan; (DADAM)

FLS & FRS : July-Dec., fruits sold in market throughout the year.

TURNERACEAE

TURNERA L.

Turnera ulmifolia L. Sp. Pl. 271. 1753; Backer in Fl. Males. 4(3) : 237. f. 2. 1951; S & J 24.

Erect, perennial undershrubs, 45–90 cm tall, with smooth, dark-brown bark. Leaves 4–12 × 1–3.5 cm, elliptic-lanceolate. appressed-hairy. Flowers 2.5–4 cm across, bright-yellow to almost white, solitary, in uppermost axils. Capsules 0.6–1x 0.4–0.6 cm. greyish-tomentose, ovoid, obtuse. Seeds minute, cylindric-clavate.

Oranamental; seldom an escape; native of West Indies.
FLS & FRS. July-Sep.

ONAGRACEAE

LUDWIGIA L.

Key to species

1. Aquatic, succulent; leaves obovate or oblanceolate, obtuse; petals 5 (-6), white; stamens 10; capsule woody; seeds quadrate. .. .. *L. adscendens*

1. Erect or prostrate; leaves lanceolate or elliptic-lanceolate; petals 4, yellow; stamens 4 or 8; capsule membranous, inflated or not; seeds subhemispheric or obovoid :
   2. Capsule 0.8–1.5 cm long, inflated, pubescent, oblong, not ribbed; seeds obovoid .. .. .. *L. perennis*
   2. Capsule 1.6-2.5 cm long, not inflated, glabrous, linear, ribbed; seeds subhemispheric.... *L. octovalvis* var. *sessiliflora*

Ludwigia adscendens (L.) Hara, J. Japan. Bot. 28:290. 1953; Raven in Reinwardt. 6:387. 1964. *Jussiaea adscendens* L. Mant. 1:67. 1767. *Jussiaea repens* L. Sp. Pl. 388. 1753; FBI 2:587; C 1:549; WI 5:311 (non *L. repens* Forst. 1771).

Creeping or floating herbs, with white spongy floats. Leaves 3-7.2 × 1.2-2.3 cm, glabrous. Flowers axillary, solitary. Capsule 1.5-4 cm long, glabrous or glabrescent.

Occasional in shallow water along margins of ponds in North and Central Gujarat.

FLS & FRS : Nov.-Mar.

Ludwigia octovalvis subsp. **sessiliflora** (Mich.) Raven in Reinwardt. 6:362. t. 3. 1963; S 101. *Jussiaea octonervia* subsp. *sessiliflora* Mich. in Mart. Fl. Bras. 13 (2): 180. t. 35. 1875. *Jussiaea suffruticosa* L Sp. Pl. 388. 1753; FBI 2:587; C 1:549; WI 5:311.

Erect or diffuse, suffrutescent herbs, 20–120 cm tall, rooting at lower nodes. Leaves 2-11 × 1.3–5 cm, elliptic-lanceolate, glabrous. Flowers yellow, axillary, solitary. Capsule pale-to dark-brown, often polished.

Throughout, a weed in cultivated fields and moist ground, common. (PANLAVANG)

FLS & FRS : Aug.-Jan.

Ludwigia perennis L. Sp. Pl. 119. 1753 (*excl. syn.* "*foliis oppositis*"); Raven in Reinwardt. 6:367. 1963; S & J 24. *Ludwigia*

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parviflora Roxb. Hort. Beng. 11. 1814 (nomen) & Fl. Ind. 1:440. 1820; EBI 2:588; C 1:550 *Jussiaea perennis* (L.) Brenan in Kew Bull. 1953:163.

Annuals, 10–60 cm tall, erect or diffuse, glabrous. Leaves 2–8×0.4–1.5 cm, lanceolate or elliptic-lanceolate, glabrous. Flowers yellow, axillary, solitary. Capsule pale-brown or straw-coloured. Seeds numerous, minute, brown, smooth, glabrous.

Throughout, in moist places; also a weed in cultivated fields; common.

FLS & FRS: Aug.–Jan.

TRAPACEAE

TRAPA L.

Trapa natans L. var. **bispinosa** (Roxb.) Makino in Inuma. Somoku-Dzusetz. (ed. 3) 1:137. 1907. *Trapa bispinosa* Roxb. Pl. Cor. 3:t. 234. 1819 & Fl. Ind. (ed Carey) 1:428. 1832; FBI 2:590; C 1:551.

Floating herbs. Leaves 2–4×2.7–6 cm, broadly ovate-rhomboid, glabrous, dark-green above, reddish-purple, pubescent and prominently nerved beneath. Flowers white above water surface, axillary, solitary. Nut 1.5–2.5 cm long and as much broad, black, obscurely 4-angled, glabrous, 2 or all angles spinescent, shortly beaked, 1-seeded.

Cultivated in ponds at some places. (SHINGHODA)

FLS: Sep.–Oct. *FRS*: Oct.–Dec.

PASSIFLORACEAE

PASSIFLORA L.

Key to species

1. Cultivated; lamina glabrous; lobes of lamina closely serrate; stipules linear, small, not gland-tipped; flowers 5.5–7 cm across; petals light-to bright-blue; corona purple, bluish-purple or lilac; floral bracts not divided into filiform segments.. .. ..*P. edulis*

1. Naturalized; lamina hairy; lobes entire or distantly coarsely dentate; stipules semilunar, pinnatisect, ultimate segments gland tipped; flowers 1.5–3 cm across, white; corona white; floral bracts divided into filiform segments... ...*P. foetida*

Passiflora edulis Sims. Bot. Mag. t. 1989. 1818; C 1:557; Bailey 691; WI 7:273. f. 120; S & J 24.

Woody climbers, with simple, axillary tendrils. Leaves 5–12×4.5–10 cm, broadly ovate, shallowly to deeply 3-lobed, coarsely serrate. Flowers axillary, solitary. Fruits not seen.

Ornamental; native of Brazil. (KRISHNA KAMAL)

FLS: Throughout the year.

Passiflora foetida L. Sp. Pl. 959. 1753; FBI 2:599; C 1:557; WI 7:278. f. 121; S & J 24.

A slender, herbaceous, foetid, tendril climber. Leaves 2–12×1.8–10.5 cm, ovate-triangular, ciliate on margins, 3-lobed. Flowers axillary, solitary. Berries 1.5–2.5 cm across, globose, glabrous, orange-red when ripe. Seeds oblong, 4-gonous, deeply pitted on faces, glabrous, pale-to dark-brown.

On hedges at some places; rare; native of Tropical America.

FLS & FRS: Aug.–Dec.

CARICACEAE

CARICA L.

Carica papaya L. Sp. Pl. 1036. 1753; FBI 2:599; C 1:557; Bailey 692; WI 2:77. Pl. 5 & f. 37; Bor 156; Ch & O 104; S & J 24; S 102.

A soft-wooded, dioecious or monoecious tree, 2–5 m tall with greenish-white, corky bark. Leaves 25–50 cm broad and as much long, variously lobed. Flowers white or creamy-white, male flowers 2–2.5 cm across, laxly panicled, female ones 3–4 cm across, fascicled. Fruit variable in size. Seeds spherical, blackish-brown, microscopically reticulate.

Cultivated; native of Trop. America. (PAPAYA, PAPAYU)

FLS & FRS: Throughout the year.

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CUCURBITACEAE 60

Key to genera

1. Flowers white :

2. Corolla rotate, fimbriate; male flowers in racemes .. .. *Trichosanthes*

2. Corolla campanulate or funnel-shaped, not fimbriate; male flowers mostly solitary :

3. Dioecious, glabrous; tendrils simple; corolla campanulate, 5-fid; berries ellipsoid, oblong or bluntly fusiform, 3–6 cm long, pale-to dark-green with longitudinal stripes or dark-red.. .. .. *Coccinia*

3. Monoecious, grey-tomentose; tendrils 2–3-branched; petals nearly free or connate at base; berries pale-green or greenish-white, pubescent, of different sizes and shapes .. .. *Lagenaria*

1. Flowers yellow, reddish-yellow, seldom greenish-yellow or creamy-white but never pure white; if pure white, fruit echinate (*Luffa echinata*) :

4. Petals free or connate at base :

5. Monoecious or dioecious; male flowers solitary (seldom few in racemes) on long peduncles; bract of male flower reniform, in middle of peduncle or beneath flower; anthers sinuate, conduplicate or horse-shoe shaped; berries papillose, tuberculate or softly echinate, seldom smooth .. .. *Momordica*

5. Monoecious; male flowers in racemes, ebracteate; anthers sigmoid or wavy; berries smooth, acutely ribbed or bristly .. .. *Luffa*

4. Corolla campanulate :

6. Tendrils 2–5-branched :

7. Glabrous; male and female flowers fascicled in same axil; berries 1–2.3 cm in diam., dark-red with deep purple longitudinal stripes .... *Diplocyclos*

7. Softly or hispidly hairy; male and female flowers solitary; berries 2.5–5 cm or more in diam., dark-green or yellow :

8. Leaves deeply lobed; flowers 1.4–2 cm across, creamy-yellow or pale-yellow, rotate or sub-campanulate .. .. *Citrullus*

8. Leaves not lobed; flowers 3.5–10 cm across, reddish-yellow, campanulate .. .. *Cucurbita*

6. Tendrils unbranched :

9. Leaves deeply lobed; stipuliform bracts fimbriate :

10. Seeds more or less plano-convex, smooth; anther-thecae straight .. .. .. *Ctenolepis*

10. Seeds irregularly oblong, widest in the middle, truncate at ends, more or less compressed; anther-thecae duplicate .. .. *Dactyliandra*

9. Leaves entire or angled but not deeply lobed; stipules wanting or if present not as above :

11. Berries red in middle, the apical and basal portions green, operculate .. .. *Corallocarpus*

11. Berries not as above :

12. Connective crested, prolonged beyond anther-cells .. .. *Cucumis*

12. Connective not as above :

13. Disc annular or cup shaped at base of style :

14. Flowers monoecious; hispid herbs; leaves 5-angled or shallowly lobed.....*Mukia*

14. Flowers dioecious; glabrous herbs; leaves entire ... . *Solena*

13. Disc absent or minute at base of style .. .. *Kedrostis*

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CITRULLUS Schrad. nom. cons.

Key to species

1. Annuals; leaves broadly ovate or ovate-deltoid, softly pubescent; berries oblong, broadly ellipsoidal or nearly globose, 15-45 cm in diam. when ripe; pulp pink to deep-red, sweet.. .. ..*C. lanatus*

1. Perennials; leaves ovate-orbicular, scabrid; berries not more than 7 cm across when ripe; pulp yellow, bitter.. .. ..*C. colocynthis*

Citrullus colocynthis (L.) Schrad. in Linnaea 12:414. 1838; FBI 2:620; C 1:571; WI 2:185; Ch & O 110; S & J 24. *Cucumis colocynthis* L. Sp. Pl. 1011. 1753. *Colocynthis vulgaris* Schrad. Ind. Sem. Goett. 2. 1833; Chakravarty in Rec. bot. Surv. Ind. 17:113. 1959.

Prostrate, scabrid-hairy herbs. Leaves 3.5–10×1.5–9 cm. deeply 3–7-lobed, scabridly- hairy, lobes acute or subacute. Flowers pale-yellow, axillary, solitary.

Throughout in plains, in small or large patches, as a weed in waste places and cultivated fields; common. (INDRAVARNA, KOKADVARNA, KADVA INDRAVARNA).

FLS & FRS : Throughout the year.

Citrullus lanatus (Thunb.) Matsumara & Nakai in Cat. Sm. Hort. Bot. Univ. Tokyo 920:38. 1920; S & J 24. *Momordica lanata* Thunb. Prodr. Fl. Cap. 13. 1794. *Citrullus vulgaris* Schrad. in Eckl. & Zeyh. Enum. Pl. Afr.-Aust. Extra Trop. 279. 1836; FBI 2:621; C 1:571; Bailey 954; WI 2:186. f. 76; Ch & O 109.

Prostrate or suberect, softly hairy herbs. Leaves 4-25× 2.5–13.5 cm, pubescent, lobed, petiolate. Flowers 1.4–1.6 cm, across, pale-yellow, axillary, solitary. Berries olive-green with dark-green longitudinal stripes. Seeds obovate-oblong, black, compressed, smooth, glabrous.

Cultivated in river beds at some places; also an escape in waste places. (TARBUCH, KALINGAR)

FLS : July–Nov. *FRS :* Apr.–June

COCCINIA W. & A.

Coccinia grandis (L.) Voigt, Hort. Sub. Calc. 59. 1845; S & J 25. *Bryonia cordifolia* L. Sp. Pl. 1012. 1753 (p. p.). *Bryonia grandis* L. Mant. 1:126. 1767. *Coccinia indica* W. & A. Prodr. 347. 1834; C 1:572; WI 2:257. f. 89. *Cephalandra indica* Naud. in Ann. Sci. Nat. 5:16. 1866 (excl. syn.); FBI 2:621. *Coccinia cordifolia* (L.) Cogn. in DC. Mon. Phan. 3:529. 1881; Ch & O 110.

Herbaceous, slender, glabrous climbers. Leaves 2.8–13× 2.7–11 cm, broadly ovate or ovate-triangular, entire or 3–5-angled or shallowly to deeply lobed, glabrous. Flowers 2–5.5×2.5–3 cm, axillary, solitary. Seeds 0.4–0 5 cm long, compressed, oblong, white, glabrous, smooth

Cultivated; also an escape or naturalized near human habitation. (GHILODA, TINDORA, TONDLI, KADVI GHOLI)

FLS & FRS : Throughout the year.

CORALLOCARPUS Welv.

Key to species

1. Female flowers solitary; berries stalked; seeds margined.. .. ..*C. epigaeus*

1. Female flowers usually fascicled or subspicate; berries sessile; seeds not margined.. .. ..*C. conocarpus*

Corallocarpus conocarpus (Dalz. & Gibs.) Cl. in Hk. f. FBI 2:628. 1879; C 1:579; *Acchmandra conocarpa* Dalz. & Gibs. Bombay Fl. 100. 1861.

Slender, glabrous, monoecious, climbing herbs. Leaves 5–7×3–5.5 cm, ash-coloured beneath, deeply 3–5-lobed, minutely hairy. Male flowers in crowded racemes on axillary peduncle. Berries conical-oblong.

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This species is listed by Cooke from Gujarat on the authority of Dalzell and Gibson citing localities Malpore and Gundar; rare.

FLS: June–Aug.

Corallocarpus epigeus (Arn.) Cl. in Hk. f. FBI 2:628. 1879; C 1:578; WI 2:323; S & J 25. *Aechmandra epigaea* Arn. in Hk. Journ. Bot. 3:274.1841.

Prostrate or climbing, monoecious, glabrous herbs. Leaves 2–5 cm long and almost as much broad, subglobose, 3–lobed, lobes secondarily lobed, scabridly hairy. Flowers greenish–yellow. Males in axillary racemes. Berries 0.8–1 cm long, ovoid or ellipsoidal. Seeds 6–9, brown, pyriform.

Kutch and Saurashtra, on hedges; Saxton reports it as a weed in cultivated fields in North Gujarat (Kharaghoda).

FLS & FRS: June–Oct.

CTENOLEPIS Hk. f.

Key to species

1. Berries globose; seed edges sharp; male flowers 5–10, on 1.8–3.5 cm long peduncle .. .. .. *C. cerasiformis*
1. Berries obreniform or hammer–shape; seed edges obtuse; male flowers sessile, on 1–1.5 cm long peduncle .. .. *C. garcini*

Ctenolepis cerasiformis (Stocks) Hk. f. in Oliver, Fl. Trop. Africa 2:558. 1871; FBI 2:630; S & J 25. *Zehneria cerasiformis* Stocks in Kew Journ. Bot. 4:419. 1852. *Blastania fimbristipula* Kotschy & Peyr. Pl. Tinn. 15. t. 7. 1865; C 1:576.

Monoecious, nearly glabrous climbers. Leaves 3–6 × 4–5 cm, strigose, 3–5–lobed, broadly ovate or nearly orbicular. Flowers pale–yellow. Berries 0.8–1.2 cm across, two–seeded: seeds ovoid, smooth, glabrous.

Throughout in plains on hedges; not common (ANKH FUTAMANI)

FLS & FRS: Aug.–Oct.

Ctenolepis garcini (L.) Cl. in Hk. f. FBI 2:629. 1879; S & J 25. *Sicyos garcini* L. Mant. 2:297. 1767. *Blastania garcini* (L.) Cogn. in DC. Mon. Phan. 3:629. 1881; C 1:576.

Herbaceous, much branched, slender, glabrous or hairy climbers. Leaves 3–4.8 × 2.3–6 cm, petiolate, deeply 3–5–lobed, broadly ovate or orbicular, scabridly hairy. Flowers creamy–white or very pale–yellow. Berries 0.6–0.8 cm long, smooth, glabrous, Seeds narrowly ovoid–oblong or cymbiform, flat, pale–brown.

Throughout on hedges (except Kutch); not common.

FLS : Oct *FRS* : Oct.–Dec.

CUCUMIS L.

Key to species and varieties

1. Fruit setose .. .. *C. setosus*
1. Fruit echinate .. .. *C. prophetarum*
1. Fruit not setose or echinate :
   2. Perennial; male flowers usually solitary. .. *C. callosus*
   2. Annuals; male flowers fascicled :
      3. Ovary hispidulous .. .. .. *C. sativus*
      3. Ovary softly hairy :
         4. Fruits 3–4 cm long .. .. *C. melo* var. *agrestis*
         4. Fruits much longer than 4 cm .. *C. melo* var. *melo* .. ..

Cucumis callosus (Rottl.) Cogn. ex Cogn. & Harms in Pflazenr. 88:129. 1924; Ch & O 109; S & J 25. *Bryonia callosa* Rottl. in Neue Schr. Ges. Nat. Fr. Berlin 4:210. 1803 (*sphalm callosa*). *Cucumis trigonous* Roxb. Hort. Beng. 70.1814 (nomen) & Fl. Ind. 2:617. 1824; FBI 2:619 (excl. syn.); C 1:569; WI 2:392, f. 144.

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Prostrate, scabrid herbs. Leaves 1.5–12×1.8–12.5 cm, broadly ovate, ovate-triangular or nearly subglobose, entire, or shallowly 3–5-lobed, scabrid. Flowers axillary, solitary, pedicellate. Berries 2.7–5×2.3–4 cm, ellipsoid-oblong, or nearly orbicular, softly echinate, at length smooth, bright-yellow with green-stripes. Seeds ellipsoid-oblong, pale-brown, smooth, glabrous.

Throughout, a common weed in waste places and cultivated fields; seldom in dense forests. (KOTHIMDU, GAIVASUKADAN)

FLS & FRS : July-Feb.

Cucumis melo L. var. **agrestis** Naud. in Ann. Sci. Nat. 1:73. 1859; C 1:569.

Annual, monoecious, prostrate herbs. Leaves 3.5–8×1.5–6 cm, lobed, lobes obtuse. Flowers yellow upto 2 cm across. Berries ellipsoid or turbinate, smooth or sparsely bristly.

Saurashtra (Santapau, 1962).

FLS : Monsoon. *FRS :* Nov.

Cucumis melo L. var. **melo.** *Cucumis melo* L. Sp. Pl. 1011. 1753; FBI 2:620; C 1:570; WI 2:389. f. 142; Ch & O 109; S & J 25.

Prostrate, monoecious herbs. Leaves 8–15 cm broad, suborbicular or subreniform, softly hairy, 5-angled or shallowly 3–7-lobed. Flowers up to 2 cm across. Berries variable in size and shape. Seeds dirty-white.

Cultivated in river beds at some places; also an escape. (KHARBUJA, SAKKARTETI).

FLS & FRS : Sep.-Nov.

Cucumis prophetarum L. Cent. Pl. 1:33. 1755 and Amoen. Acad. 4:295. 1759; FBI 2:619; C 1:570; WI 2:391; S & J 25.

Prostrate, monoecious, herbs. Leaves 1–3.5×1–2.5 cm, broadly ovate, shallowly to deeply 3–5-lobed; scabridly hairy.

Flowers axillary, solitary, males often fasciculate. Berries 3–4×2.3–3 cm, ellipsoidal-oblong, beaked, minutely echinate. Seeds glabrous, straw or pale-brown, ellipsoidal-oblong.

Saurashtra and Kutch. (KANTALO INDRAN, KANTALAN INDRANAN)

FLS & FRS : July-Oct.

Cucumis sativus L. Sp. Pl. 1012. 1753; FBI 2:620; C 1:570; WI 2:391. f. 143.

Scabrid, monoecious herbs, trailing or climbing. Leaves 5–10 cm across and almost as much broad, entire or shallowly 3–5-lobed, densely hairy. Flowers yellow, solitary, axillary, pedicellate. Berries of various shapes, narrowly or broadly oblong, pale- to dark-green or pale-yellow. Seeds oblong, glabrous, white, subacute at ends.

Cultivated; also an escape. (KAKADI)

FLS & FRS : Throughout the year, profuse in monsoon.

Cucumis setosus Cogn. in DC. Mon. Phan. 3:491. 1881; Ch & O 108.

Monoecious, trailing or climbing herbs. Leaves 3.5–7 cm long and almost as much broad, broadly ovate or nearly orbicular, shallowly 3-lobed, membranous, densely hispid. Flowers yellow, axillary, solitary. Berries 2–2.5×1–1.2 cm, ellipsoid-oblong, setose; bristles reddish-brown.

Pavagadh and Chhotaudepur; rare.

FLS & FRS : Aug.-Sep.

CUCURBITA L.

Cucurbita maxima Duch. in Lam. Encycl. 2:151. 1786; FBI 2:622; C 1:582; Bailey 952; WI 2:394; Ch & O 111; S & J 25.

Trailing or climbing, villous herbs. Leaves 10–17×11–20 cm or more, entire or shallowly lobed, suborbicular or reniform,

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strigosely hairy. Flowers 4.5–10 cm across, reddish-yellow or orange-coloured, axillary, solitary. Berries oblong or nearly globose, yellowish-brown, glabrous, variable in size and weight; pulp yellow or orange.

Cultivated; seldom an escape near human habitation. (KOLU, PATKOLU, LALKOLU)

FLS: Monsoon. *FRS*: Sold throughout the year.

DACTYLIANDRA (Hk. f.) Hk. f.

Dactyliandra welwitschii Hk. f. in Oliver, Fl. Trop. Afr. 2:557. 1871; Bhandari & Singh in Kew Bull. 19 (1) :133. 1964.

Monoecious, annual, extensive, tendril climbers. Leaves digitately (3–) 5-lobed, lobes ovate, scabro-punctate; stipuliform bracts 0.8–1.5 cm in diam., nearly orbicular, ciliate. Male flowers 10–20, on 5–8 cm long, slender, axillary peduncle, rarely solitary, axillary, among females; female flowers in fascicles of 3, or solitary by suppression of two laterals. Berries ellipsoid–globose, 1–1.3 cm in diam., smooth, dull-red when ripe. Seeds 9–14, horizontally embedded in pulp, compressed, angled and somewhat asymmetrically cissoid, obliquely narrowed at base, very narrowly margined or winged, glabrous, obscurely corrugate, light-brown.

Reported by Bhandari & Singh from Kutch. (ANKPHU-TAMANI)

FLS & FRS: Aug.–Nov.

DIPLOCYCLOS (Endl.) Von Post. & Ktze.

Diplocyclos palmatus (L.) C. Jeffrey in Kew Bull. 15:352. 1962; Ch & O 107; S & J 25. *Bryonia palmata* L. Sp. Pl. 1012 1753 (excl. syn.) *Bryonia laciniosa* Sensu L. Sp. Pl. 1013. 1753 (p. p.); FBI 2:622. *Bryonopsis laciniosa* Sensu Naudin in Ann. Sci. Nat. (Ser. 6.) 12:141. 1859 (pro maj. parte, excl. type et sensu auct. mult. non (L.) Naud. loc. cit., sensu stricto); C 1:534; WI 1:232.

Herbaceous, slender, extensive, monoecious, climber Leaves 2.5–10×3–10.5 cm, palmately 3–7-lobed, membranous, glabrous. Flowers creamy-white, in axillary fascicles. Berries nearly spherical, smooth. Seeds obovate, creamy white or pale-yellow, minutely scrobiculate.

Throughout on hedges; common. (SHIVLINGI)

FLS: Aug.–Dec *FRS*: Sep.–Dec.

KEDROSTIS Medik.

Kedrostis rostrata (Rottl.) Cogn. in DC. Mon. Phan. 3:636. 1881; C 1:577; WI 5:317; S & J 25. *Bryonia rostrata* Rottl. Ges Naturf. Neue Schr. 4:212. 1803. *Rhynchospora foetida* Cl. in Hk. f. FBI 2:627. 1879.

Scandent or trailing in absence of support, glabrous or thinly hairy herbs. Leaves 1.5–4×1–5 cm, broadly ovate, entire or shallowly to deeply 3-lobed, hispid. Flowers yellow, axillary, males 2–4, in racemes, females solitary or fascicled. Berries 1–1.2 ×0.6–0.8 cm, ovoid, at length glabrous, beaked. Seeds elliptic, smooth, glabrous.

Kutch, Saurashtra and North Gujarat, on hedges; not common. (NURKVEL)

FLS & FRS: July–Sep.

LAGENARIA Ser.

Lagenaria leucantha (Duch.) Rusby in Mem. Torr. Bot. Cl. 6:43. 1896. *Cucurbita leucantha* Duch. in Lam. Encycl. Meth. 2:150. 1786. *Cucurbita siceraria* Molin. ex Willd. Sp. Pl. 4:607. 1803. *Lagenaria vulgaris* Ser. in Mem. Soc. Phys. Geneve 1:25. 1825; FBI 2:613; C 1:581. *Lagenaria siceraria* (Mol... ex Will... in Pub. Field. Mus. Nat. Hist Chic. ... 19... ff. 7–9; S & J 25.

A stout, climbing or trail... cm or more, shallowly 3–5-lob... broad...

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Flowers 3–5 cm across, white, axillary, solitary. Berries light-to dark-green, of various shapes and sizes. Seeds white, obovate- or obovate-triangular, flat, glabrous.

Cultivated. (DUTHIE, KADRI TUNEDI)

FLS & FRS : Throughout the year.

LUFFA Cav.

Key to species and varieties

1. Roots not tuberous :
   2. Flowers white, dioecious; stamens 3; fruit echinate.. .. ..*L. echinata*
   2. Flowers yellow, monoecious; stamens 3 or 5; fruit not echinate:
      3. Stamens 5; fruit smooth; seeds smooth, winged; leaves deeply 3–7-lobed.. .. ..*L. cylindrica*
      3. Stamens 3; fruit sharply ribbed; seeds not winged, wrinkled; leaves shallowly 3–7-lobed :
         4. Fruits 15–32 cm long, not bitter; cultivated, seldom an escape.. .. ..*L. acutangula* var. *acutangula*
         4. Fruit 4–10 cm long, very bitter; wild.. .. ..*L. acutangula* var. *amara*
1. Roots tuberous.. .. ..*L. tuberosa*

✓**Luffa acutangula** (L.) Roxb. var. **acutangula.** *Luffa acutangula* (L.) Roxb. Hort. Beng. 70. 1814 (nomen) & Fl. Ind. 3:713. 1832; FBI 2:615; C 1:566; Bailey 953; WI 6:177. f. 61; S & J 25.

Glabrous annuals. Leaves 5.5–18 × 5.2–25 cm, broadly ovate, angled or shallowly lobed. Flowers pale-to bright-yellow, 2.5–2.8 cm across. Berries linear-obovate or bluntly cylindric-fusiform, pale – to dark-green. Seed 0.4–0.7 cm long, black, ovate-oblong, flat, corrugated on sides (TURIYA)

FLS & FRS : Throughout the year; abundant in monsoon.

✓**Luffa acutangula** (L.) Roxb. var. **amara** (Lam.) Cl. in Hk. f. FBI 2:615. 1879; C 1:567; WI 6:179; Ch & O 107; S & J 25; S 103. *Cucumis acutangulus* L. var. *amara* Lam. Encycl. 2:74. 1786. *Luffa amara* Roxb. Fl. Ind. 3:715. 1832

Slender, glabrous annuals. Leaves 1.5–12.7×1.2–12 cm, broadly ovate, entire or 3–7-lobed, membranous, glabrous. Flowers pale-yellow, 2.5–3 cm across. Berries 4–10×2–3 cm, linear-obovate or cylindric-fusiform. Seeds 0.4–0.6 cm long, black, ovoid, flat, minutely tuberculate or corrugated.

Throughout on hedges and on low bushes or trees in forests; common and abundant. (DODKI, KADVI GHISHODI: JUNGLI TURIYA)

FLS : July–Oct. *FRS* : Aug.–Jan.

✓**Luffa cylindrica** (L.) M. J. Roem. Syn. Mon. 2:64. 1846; Bailey 953; WI 6:179. f. 62; S & J 25. *Momordica cylindrica* L. Sp. Pl. 1009. 1753. *Luffa aegyptiaca* Mill. Gard. Dict. ed. 8. 1768; FBI 2:614; C 1:565.

Monoecious, slender, climbing, glabrous herbs. Leaves 5–18.5×8–22 cm, broadly ovate, glabrous. Flowers 3–3.5 cm across, bright-yellow, males in short racemes, female solitary. Berries 10–30 cm long, cylindric–oblong, pale – to dark-olivaceous –green, with dark-green, longitudinal stripes. Seeds flat, narrowly winged, glabrous.

Cultivated (GHEE-TURAI, GALKU, MARTIGONSALI, GHOSALE)

FLS & FRS : Throughout the year.

Luffa echinata Roxb. Hort. Beng. 104. 1814 (nomen) & Fl. Ind. 3:716. 1832; FBI 2:615; C 1:567; WI 5:181. f. 64; S & J 25.

Glabrous climbers, with 3-branched tendrils. Leaves 3–7× 5–8.8 cm, subreniform or subrotund, scabridly hairy, shallowly

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3–5-lobed. Berries 2.5–3.2×1.5–2.5 cm, ellipsoid or nearly globose; bristles 0.8–1.5 cm long, hairy. Seeds not winged, slightly verrucose.

On hedges; not frequent. (KUKADVEL)

FLS & FRS : Aug.–Oct.

Luffa **tuberosa** Roxb. Hort. Beng. 104. 1814 (nomen) & Fl. Ind. 3:717. 1832; Chakravarty in Rec. bot. Surv. Ind. 17:81. 1959. *Momordica cymbalaria* Fenzl ex Naud. in Ann. Sci. nat. (Ser. 4) 12:134. 1859; FBI 5:618; C 1:564. *Momordica tuberosa* (Roxb.) Cogn. in DC. Mon. Phan. 3:454. 1881; WI 6:412. f. 157.

Perennial, slender, tendril climber. Leaves 0.9–1.5×1–1.8 cm, shallowly 5–7-lobed, orbiculo-reniform. Flowers yellow, in 1–2.7 cm long racemes. Fruits 1.5–2 cm long, broadly fusiform. Seeds broadly ovoid, dark-brown, compressed, smooth.

Saurashtra and Chhotaudepur forest division (Narukot), on hedges; rare.

FLS & FRS : Nov.

MOMORDICA L.

Key to species

1. Flowers monoecious; berries papillate or tuberculate :
   2. Male flower with bract nearly in middle of peduncle .. .. *M. charantia*
   2. Male flower with bract at tip of peduncle .. *M. balsamina*
1. Flowers dioecious; berries softly echinate :
   3. Male flower solitary on peduncle .. .. *M. dioica*
   3. Male flowers several on peduncle .. .. *M. denudata*

Momordica balsamina L. Sp. Pl. 1009. 1753; FBI 2:617; C 1:562; WI 6:408; S & J 24.

Very slender, climbing, glabrous or sparsely hairy herbs. Leaves 3–7 cm across, nearly orbicular, 3–5-lobed, membranous. Flowers bright-yellow. Berries 3–6 cm long, broadly ovoid or subglobose, beaked. Seeds grey, ovate, flat, minutely tuberculate.

Kutch, Saurashtra and north Gujarat (Khedbrahma, Keshni), on hedges; not common. (VADKARELA, PATOLA, CHOCHIDAN)

FLS & FRS : Throughout the year.

Momordica charantia L. Sp. Pl. 1009. 1753; FBI 2:616; C 1:562; Bailey 956; WI 6:408. ff. 154–155; S & J 25.

Slender, climbing or trailing herbs, densely villous in younger parts. Leaves 4–10×4–9.5 cm, deeply 5–9-lobed, membranous, glabrous. Flowers bright-yellow, solitary, axillary, 2–2.5 cm across. Berries obtusely fusiform, pendulous, densely papillate or tuberculate. Seeds pale-yellowish-brown, flat, variously sculptured.

Throughout under cultivation or an escape. (KARELA, KARELI)

FLS & FRS : Throughout the year except for a few cold season months.

Momordica denudata (Thw.) Cl. in Hk. f. FBI 2:618. 1879; Ch & O 105. *Momordica dioica* Roxb. ex Willd. var. *denudata* Thw. Enum. Fl. Zeyl. 126. 1858–1864.

Slender, glabrous climbers; tendrils unbranched. Leaves 7–8×6–6.5 cm, membranous, ovate, entire or 3–5-lobed. Flowers yellow, dioecious. Berries globose, softly echinate, beaked.

At the foot of Pavagadh hill, on a hedge; rare.

FLS & FRS : July

Momordica dioica Roxb. ex Willd. Sp. Pl. 4:605. 1805; FBI 2:617; C 1:563; WI 6:411. ff. 155–156; Ch & O 105; S & J 25.

Perennial, trailing or climbing, glabrous herbs. Leaves 3–11×3–9.8 cm, broadly ovate, entire or very shallowly 3–5-lobed, membranous. Flowers bright-yellow, axillary, solitary, peduncu-late. Berries 2.5–5×1.5–2.6 cm, ovate or obovate, softly echinate. Seeds ovate, flat, smooth, pale-yellow or red.

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Throughout on hedges and low shrubs and herbs in the forests. (KANKODA, KANTOLA, VANZKANTOLI)

FLS & FRS : July–Nov.

MUKIA Arn.

Mukia maderaspatana (L.) M. Roem. Syn. Pep. 47. 1846; S & J 25; S 104. *Cucumis maderaspatana* L. Sp. Pl. 1012. 1753. *Mukia scabrella* Arn. in Hk. Journ. Bot. 3:276. 1841; FBI 2:623. *Melothria maderaspatana* Cogn. in DC. Mon. Phan. 3:623. 1881; C 1:573; WI 5:336; Ch & O 112.

Prostrate or climbing, scabridly hairy, monoecious annuals. Leaves 1.5–9×1–8.8 cm, entire or shallowly 3–5-angled or lobed, ovate-triangular, seldom subreniform. Flowers pale- to bright-yellow, male and female in same axil, male pedicellate, female sessile. Berries 0.6–1 cm broad, spherical, glabrous, smooth. Seeds grey or light black, ovoid-oblong, compressed, somewhat wrinkled, scrobiculate.

Throughout, on hedges or on low herbs or shrubs; common. (CHANAK-CHIBHDI)

FLS & FRS : July–Oct.

SOLENA Lour.

Solena heterophylla Lour. Fl. Cochinch. 1:514. 1790; S 104. *Bryonia umbellata* Klein ex Willd. Sp. Pl. 4:618. 1805. *Zehneria umbellata* Thw. Enum. 125. 1858; FBI 2:625 (p. p.). *Melothria heterophylla* (Lour.) Cogn. in DC. Mon. Phan. 3:618. 1881; C 1:575; WI 6:335. f. 119; Ch & O 111.

Slender, dioecious, perennial, glabrous herbs. Leaves 5–16×2.5–10.5 cm, ovate, deltoid-ovate, ovate-oblong or suborbicular. Flowers 0.6–0.8 cm long, creamy-yellow, axillary, subsessile. Berries 3–3.5×1.5–2 cm, ellipsoid or subglobose, reddish-yellow or orange-coloured.

Dangs, Rajpipla, Chhotaudepur, Pavagadh and Panchmahals; not common. (GOMETI)

FLS : June–Oct. *FRS :* July–Jan.

TRICHOSANTHES L.

Key to species

1. Fruit not more than 6 cm long :
   2. Cultivated; leaves not lobed or angled, strigose, coriaceous; bracts absent; male flower solitary; stamens free .. *T. dioica*
   2. Wild; leaves angular or lobed, membranous or coriaceous; bracts foliaceous, minute or absent; male flowers in racemes; stamens united :
      3. Leaves nigro-punctate beneath; bracts foliaceous, ovate or obovate, laciniate or deeply serrate; fruits globose; pulp green .. .. *T. bracteata*
      3. Leaves not nigro-punctate beneath; bracts minute or wanting; fruit ovoid-fusiform; pulp red.... *T. cucumerina*
1. Fruit 60–125 cm long.. .. .. *T. anguina*

Trichosanthes anguina L. Sp. Pl. 1008. 1753; FBI 2:610; C 1:561.

Annuals, monoecious, pubescent in younger parts. Leaves 5.5–8×5–9.3 cm, 5–9-lobed, thinly hairy beneath. Flowers white, male in long racemes, females solitary. Berries straight or spirally twisted, linear-cylindric, glaucous-green.

Blatter (1908) and Thaker J. I. (1926) reported it to be cultivated in Kutch. (PANDOLA)

FLS & FRS : July–Oct.

Trichosanthes bracteata (Lam.) Voigt, Hort. Sub. Calc. 58. 1845; S & J 25; S 102. *Modecca bracteata* Lam. Encycl. Meth. Bot. 4:210.1797. *Trichosanthes palmata* Roxb. Fl. Ind. 3:704. 1832; FBI 2:606; C 1:560.

Extensive, stout, woody climbers, with 2–3-branched tendrils. Leaves 3–15×2.9–12 cm, deeply 3–5-lobed, glabrous. Flowers white, axillary. Berries 3.5–5 cm across, red, with orange stripes when ripe.

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Dangs, Rajpipla, Chhotaudepur, Pavagadh, Panchmahals, north Gujarat (Khedbrahma) and Saurashtra; not frequent. (RATANI, INDRADAMNI, KALULANA AMBA).

FLS & FRS : May–Aug.

Trichosanthes cucumerina L. Sp. Pl. 1008. 1753; FBI 2:609; C 1 : 560; Ch & O 105; S & J 25.

Monoecious, herbaceous, slender, tendrillar climbers. Leaves 3.5–12.5×4–14.7 cm, broadly ovate, shallowly to deeply 3–7-lobed. Flowers white, male in 2–4.5 cm long racemes, female solitary, male and female flowers in same or different axils. Berries 3–7×2.7–5 cm, glabrous.

Throughout; common on hedges and in forests. (JANGLI PARVAL)

FLS & FRS : July–Oct.

Trichosanthes dioica Roxb. in Wall. Cat. no. 6692. A-C (nomen) & Fl. Ind. 3:701. 1832; FBI 2:609.

Trailing or climbing, strigosely hairy, dioecious herbs. Leaves 3-4.5×2.5–4 cm, broadly ovate. Male and female flowers axillary, solitary. Berries 4–6×2–4 cm, ellipsoidal–oblong, glabrous, smooth, pale–to dark-green with green stripes. Seeds 0.2–0.3 cm broad, angular or subglobose, glabrous, smooth, greenish-brown.

Cultivated. (PADVAL, PARVAL)

FLS & FRS : Monsoon profuse; also in hot season but not profuse.

BEGONIACEAE 61

BEGONIA L.

Begonia crenata Dryand. in Trans. Linn. Soc. 162. t. 14. 1791; FBI 2:651; C 1:584.

10–15 cm tall, slender herbs. Leaves 5.5–8.5×3.5–4.2 cm, ovate to suborbicular, obliquely cordate at base, silvery-white

beneath. Flowers 0.8–1.3 cm across, pale–to bright-pinkish or nearly white. Capsule 3.5–4.5 cm across (including wings), 3-winged, crowned by accrescent perianth. Seeds ellipsoid, glabrous, minute.

In forest undergrowth in Chhotaudepur forest division (Mogra); very rare.

FLS & FRS : Sep.–Oct.

CACTACEAE 62

OPUNTIA L.

Opuntia elatior Mill. Gard. Dict. (ed. 8) no. 4. 1768; WI 7:102. Pl. 6; S & J 25; S 107. *Opuntia dillenii* Grah. ex Dalz. & Gibs. Bombay Fl. Suppl. 39. 1861; FBI 2:657 (p. p.). *Opuntia nigricans* Woodrow in Rec. Bot. Surv. India 1:89. 1895; C 1:592 (non How. 1819).

90–200 cm tall shrubs, with jointed stem; joints 5–30×3–15 cm, succulent, leafless, spiny, flat, obovate, glaucous-green. Flowers yellow or pale-pink, at length red or reddish-purple, axillary, solitary, on free margins of joints. Ripe berries fleshy, edible.

Frequently raised as a hedge along cultivated fields; in scrub forests as an escape. (PHAFDO THOR)

FLS & FRS : Dec.–May

MOLLUGINACEAE

Key to genera

1. Ripe carpels 5, free; ovary one-loculed, one-ovulate .. .. *Gisekia*
1. Ripe carpels 3–5, syncarpous; ovary 3–5-loculate, each loculus many ovulate :
   2. Flowers in axillary fascicles; prostrate herbs; seeds appendaged .. .. *Glinus*
   2. Flowers in terminal paniculate cymes; erect or diffuse herbs seeds not appendaged .. .. .. *Mollugo*

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GISEKIA L.

Gisekia pharnaceoides L. Mant. 562. 1771; FBI 2:664; C 1:595. WI 4:130.

Diffuse or suberect herbs. Leaves 1–3×0.3–0.4 cm, linear-oblong or linear-lanceolate. Flowers white or pink, on filiform peduncles Ripe carpels 5, membranous, 1-seeded. Seeds sub-reniform, compressed, with scattered, white, glandular prominences.

Kutch, north Gujarat, central Gujarat (Vallabh Vidyanagar, Anand) and south Gujarat (Broach, Rajpipla); not common.

FLS & FRS : Sep.–Dec.

GLINUS L.

Key to species

1. Plants densely grey-woolly-tomentose; leaves alternate, opposite or whorled; pedicels 0.1–0.4 cm long, grey-tomentose; stamens more than 10; capsule 5-valved, densely hairy .. .. *G. lotoides*
1. Plants glabrous; leaves whorled; pedicels 0.6–1.2 cm long, glabrous; stamens 3; capsule 3-valved, glabrous.. *G. oppositifolius*

Glinus lotoides L. Sp. Pl. 463. 1753; Ch & O 114; WI 4:136; S & J 23; S 108. *Mollugo hirta* Thunb. Prodr. Fl. Cap. 24. 1794; FBI 2:662; C 1:593.

Radially spreading, prostrate herbs. Leaves 0.4–2×0.3–0.5 cm, obovate or suborbicular. Flowers greenish-white in axillary fascicles. Capsules 0.3–0.5 cm long, ovoid, enclosed in persistent calyx. Seeds minute, reniform, faintly tuberculate, dark-brown or nearly black.

Throughout in drying moist ground. (MITHO OKHARAD)

FLS & FRS : Throughout the year.

Glinus oppositifolius (L.) A. DC. in Bull. Herb. Boiss. (Ser. II) 1:559. 1901; WI 4:136; Ch & O 114; S & J 23; S 108. *Mollugo oppositifolia* L. Sp. Pl. 89. 1753; C 1:593. *Mollugo spergula* L. Syst. (ed. 10) 881. 1759; FBI 2:662.

Diffuse, radially spreading herbs. Leaves 1–1.8×0.1–0.4 cm, spathulate-elliptic, whorled, glabrous. Flowers white, in axillary fascicles. Capsule 0.3–0.5 cm long, ellipsoid, enclosed in persistent calyx. Seeds minute, many, dark-brown, reniform, tuberculate.

Throughout in drying moist ground; common. (KADVO OKHARAD)

FLS & FRS : Throughout the year.

MOLLUGO L.

Key to species

1. Leaves radical .. .. *M. nudicaulis*
1. Leaves both cauline and radical; cauline ones in pseudo-whorls :
   2. Leaves more than 0.3 cm broad; stem and branches green; seeds prominently tuberculate .. .. .. *M. pentaphylla*
   2. Leaves less than 0.3 cm broad; stem and branches pink or light-red; seeds smooth or very faintly veined.. *M. cerviana*

Mollugo cerviana (L.) Ser. in DC. Prodr. 1:392. 1824; FBI 2:663; C 1:594; WI 6:395; Ch & O 115. *Pharnaceum cerviana* L. Sp. Pl. 272. 1753.

8–20 cm tall, filiform, glabrous annuals. Leaves 0.5–1.5 cm long, spathulate or narrowly linear, sessile. Flowers white, in terminal and axillary, trichotomous umbellate cymes. Capsule broadly ellipsoid, glabrous Seeds minute, reniform blackish-brown.

Rajpipla, Pavagadh, north Gujarat (Mahudi); on the whole rare.

FLS & FRS : July–Nov.

Mollugo nudicaulis Lam. Encycl. Meth.. Bot. 4:234. 1797; FBI 2:664; WI 6:396 f. 146; S & J 23.

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Erect or diffuse, 5–30 cm tall, filiform herbs. Leaves 0.5–4.6 ×0.3–1.2 cm, oblong-spathulate, glabrous. Flowers white, in terminal panicles. Capsule ±0.1 cm long, ellipsoid or nearly globose, brown, many-seeded. Seeds minute, black, reniform, closely reticulate.

From Rajpipla to Saurashtra in plains; on the whole rare.

FLS & FRS : July-Oct.

Mollugo pentaphylla L. Sp. Pl. 89. 1753; C 1:594; WI 3:397; Ch & O 114; S & J 23. *Mollugo stricta* L. Sp. Pl. (ed. 2) 131. 1762; FBI 2:663.

Diffuse or suberect, slender, dichotomously branched herbs. Leaves radical as well as cauline, 1–2.5×0.4–0.7 cm, linear to linear-lanceolate, glabrous, sessile. Flowers minute, in terminal, paniculate cymes. Capsule globose, glabrous. Seeds many, minute, reniform, dark-brown, reticulate.

Throughout; common.

FRS & FLS : July-Nov.

AIZOACEAE

63

Key to genera

1. Stamens hypogynous :
   2. Ovary 3–5-celled.. .. ..*Sesuvium*
   2. Ovary 1–2-celled :
      3. Operculum of capsule 1-valved; style 1; flowers solitary or clustered.. .. ..*Trianthema*
      3. Operculum of capsule 2-valved; style 2; flowers clustered .. ..*Zaleya*
1. Stamens inserted on the calyx tube.. .. ..*Corbichonia*

CORBICHONIA Scop.

Corbichonia decumbens (Forsk.) Exell in Journ. Bot. 73:80. 1935; Jeffrey in Fl. Trop. Afr. (Aizoaceae) 9. f. 3. 1961. *Orygia decumbens* Forsk. Fl. Aegypt.-Arab. 103. 1775; FBI 2:661; C 1:592; Blatter in Journ. Bombay nat. Hist. Soc. 18:772. 1908; WI 7:110.

Diffuse herbs. Leaves 1–5.2×0.5–2.6 cm, obovate or obovate-oblong, glaucous-green. Flowers 0.7–0.9 cm across, in 3.5–6 cm long, lax cymes. Capsule 0.4–0.6 cm long, pale-yellow, smooth, glabrous, 5-valved. Seeds many, brownish-black, reniform, somewhat compressed, strophiolate, minutely tuberculate.

Kutch, not frequent.

FLS & FRS : Aug.

SESUVIUM L.

Key to species

1. Main stem and branches prostrate, papillose; leaves 0.8–1.3 ×0.4–0.6 cm, elliptic-oblong; stamens 5–7; ovary 2-loculed; styles 2; seeds rugose.. .. ..*S. sesuvioides*
1. Main stem prostrate, branches erect; stem and branches not papillose; leaves 1.8–4.5×0.4–1 cm, linear, obovate-oblong, or spathulate-oblong; stamens many; ovary 3-loculed; styles 3; seeds smooth, glabrous.. .. .. ..*S. portulacastrum*

Sesuvium portulacastrum (L.) L. Syst. (ed. 10) 1058. 1759; FBI 2:659; C 1:589; S & J 24. *Portulaca portulacastrum* L. Sp. Pl. 446. 1753.

Perennial, fleshy herbs, rooting at lower nodes. Leaves glabrous, minutely punctate. Flowers bright-pink or purple, axillary, solitary, pedicellate. Capsule 0.4–0.6 cm long, oblong, apiculate, circumscissile. Seeds numerous, minute, black, glabrous, smooth.

Along sea coast in mud flats and on sands; common.

FLS & FRS : Nearly for the whole year.

Sesuvium sesuvioides (Fenzl) Verdcourt in Kew Bull. 12:349. 1957; Jeffrey, Fl. Trop. E. Afr. (Aizoaceae) 22. 1961; S & J 24. *Diplochonium sesuvioides* Fenzl, Nov. Stirp. Dec. 7:58. 1839 & in Ann. Wien. Mus. 2:292. 1839. *Trianthema hydaspica* Edgew. in Journ. Linn. Soc. 6:203. 1862; FBI 2:661; C 1:591

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Prostrate, radially spreading herbs. Leaves fleshy, glabrous. Flowers axillary, solitary or 2–3–fascicled, sessile. Capsule 0.4–0.6 cm long, membranous, circumscissile, upper portion 1-seeded, lower half 8–12-seeded. Seeds cochleate, black, rugose.

Saurashtra and Kutch; not common.

FLS & FRS : Aug.–Oct.

TRIANTHEMA L.

Key to species

1. Stamens 10 or more .. .. *T. portulacastrum*
1. Stamens 5 .. .. *T. triquetra*

Trianthema portulacastrum L. Sp. Pl. 223. 1753; Ch & O 113; S & J 24. *Trianthema monogyna* L. Mant. 1:69. 1767; FBI 2:660; C 1:589.

Subsucculent, prostrate, often radially spreading herbs. Leaves 0.8–4.5 × 0.6–3 cm, subopposite, obovate–cuneate. Flowers white or bright–pink, axillary, solitary, in pouch or between forks of branches. Capsule circumscissile, glabrous. Seeds many, dull black, reniform, with faint, wavy ribs.

Throughout, in plains, in small or large patches; common. (SATODO)

FLS & FRS : Throughout the year, profuse in monsoon.

Trianthema triquetra Rottl. ex Willd. in Ges. Nat. Fr. Neue Schr. 4:181. 1803; C 1:590. *Trianthema crystallina* auct. non Vahl; FBI 2:660.

Prostrate herbs, studded with minute papillae. Leaves 0.3–0.7 cm long, linear or linear–lanceolate, subfleshy, glabrous. Flowers pink or white, axillary, solitary or clustered. Capsules minute. Seeds blackish-brown, orbicular or subreniform, compressed.

Kutch, Saurashtra, north Gujarat, Panchmahals and Broach; not common.

FLS & FRS : Aug.–Sep.

ZALEYA Burm. f.

Key to species

1. Stamens 10–15 .. .. *Z. decandra*
1. Stamens 5 .. .. *Z. govindia*

Zaleya decandra Burm. f. Fl. Ind. 110. t. 31. f. 3. 1768. *Trianthema decandra* L. Mant. 1:70. 1767; FBI 2:661; C 1:591; S & J 24.

Diffuse herbs. Leaves 0.5–2 × 0.2–1.2 cm, elliptic-oblong or slightly obovate, glabrous. Flowers pink, few to many, in axillary fascicles. Capsule 0.3–0.4 cm long. Seeds orbicular or reniform, compressed, rugulose.

Saurashtra and Broach; rare.

FLS & FRS : July–Dec.

Zaleya govindia (Buch.–Ham. ex G. Don) Nair in Bull. bot. Surv. India 8:86. 1966. *Trianthema govindia* Buch.–Ham. ex G. Don, Gen. Syst. 3:72. 1834 S & J 24. *Trianthema pentandra* auct. non L. 1767; FBI 2:660; C 1:590.

Diffuse herbs, 20–40 cm long. Leaves 1.7–3.5 × 0.7–2.2 cm, elliptic–oblong, seldom obovate, glabrous. Capsule 0.4–0.5 cm long, circumscissile, few-seeded. Seeds reniform–orbicular, compressed, rugose, light–black.

Saurashtra; Saxton has collected it from north Gujarat.

FLS & FRS : Apr.–Aug.

APIACEAE (UMBELLIFERAE)

Key to genera

1. Umbel simple .. .. *Centella*
1. Umbel compound :
2. Mericarps winged on margins :
3. Portion of the fruit between the margin and seed hyaline .. .. *Zeuxinia*

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3. Portion of the fruit between the margin and seed not hyaline :

4. Fruit strongly, dorsally flattened, at most twice as long as broad; leaves pinnate or bipinnate .. .. *Peucedanum*

4. Fruit not strongly, dorsally flattened, more than twice as long as broad; leaves tripinnate .. *Anethum*

2. Mericarps not winged on margins :

5. Calyx teeth distinct :

6. Ovary and fruit glabrous .. .. .. *Coriandrum*

6. Ovary and fruit bristly .. .. *Cuminum*

5. Calyx teeth not distinct :

7. Flowers yellow or greenish-yellow .. *Foeniculum*

7. Flowers white or pinkish :

8. Involucres pinnatifid; ovary and fruits densely bristly .. .. *Daucus*

8. Involucres, ovary and fruits not as above :

9. Fruit laterally compressed :

10. Leaves simple or pinnate with simple leaflets; furrows on mericarps 2-3-vittate .. .. *Pimpinella*

10. Leaves pinnate with divided leaflets; furrow on mericarps 1-vittate .. .. *Trachyspermum*

9. Fruit not laterally compressed .. *Sesili*

ANETHUM L.

Anethum graveolens L. Sp. Pl. 263. 1753; Bailey 75; S & J 25. *Anethum sowa* DC. Prodr. 4:186. 1830; WI 1:78. *Peucedanum graveolens* Hiern in Oliver Fl. Trop. Afr. 3:19. 1871; FBI 2:709; C 1:606.

20-60 cm tall, glabrous, glaucous-green, perennial herbs. Leaves 2-3-pinnate, ultimate segments 0.4-1.2 cm long, linear. Flowers yellow, in decompound, terminal umbels. Fruits 0.4-0.6 cm long, dorsally compressed.

Cultivated at some places; seldom an escape in waste places. (SUWA)

FLS : Dec.-Feb. *FRS* : Jan -Mar.

CENTELLA L.

Centella asiatica (L.) Urb. in Mart. Fl. Bras. 11:287. 1879; WI 2:117. t. 55; S & J 26; S 109. *Hydrocotyle asiatica* L. Sp. Pl. 234. 1753; FBI 2:669; C 1:598.

Radially creeping, 30–40 cm long herbs. Leaves 2–3.2 cm in diam., broadly suborbicular to reniform, glabrous. Flowers pink or red, in axillary, fasciculate umbels. Fruit 0.4–0.5 cm long, ovoid, reticulately wrinkled, primary and secondary ridges distinct.

Throughout in moist ground; not common. (BHRAMI, MOTI BHRAMI, KHAD BRHAMI, VIDYA BRHAMI)

FLS & FRS : Throughout the year.

CORIANDRUM L.

Coriandrum sativum L. Sp. Pl. 258. 1753; FBI 2:717; C 1:609; WI 2:347. ff. 130-131; S & J 26.

30–50 cm tall herbs. Leaves 2-6 cm long, alternate, pinnatisect, glabrous; segments 0.8–1.5 × 0.2–0.8 cm, variously lobed. Flowers pale-to bright-rose or nearly white. Fruit 0.3-0.5 cm long, ellipsoid or nearly globose, prominently ribbed.

Cultivated; also an escape in waste places. (KOTHMIR, DHANA)

FLS & FRS : Throughout the year.

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CUMINUM L.

Cuminum cyminum L. Sp. Pl. 254. 1753; FBI 2:718; C 1:609; WI 2:396. f. 146.

10–25 cm tall, annual herbs. Leaves 2–3-partite, ultimate segments filiform, glabrous. Flowers pale-to bright-rosy-pink or almost white. Fruits 0.3–0.4 cm long, cylindric, prominently ridged, bristly.

Cultivated at some places, on a large scale in north Gujarat; also an escape in waste places. (JIRU)

FLS & FRS : Oct.–Mar.

DAUCUS L.

Daucus carota L. **var. sativa** DC. Prodr. 4:211.1830; S & J 26. *Daucus carota* L. Sp. Pl. 242. 1753; FBI 2:718; C 1:609; Bailey 752; WI 3:19. Pl. 4.

Biennial herbs, 1–1.5 m tall. Leaves 2–3-pinnate, ultimate segments 1–2.5 × 0.3–0.7 cm, linear-lanceolate or oblong-lanceolate, dark-green. Flowers white or creamy-white. Fruits 0.4–0.7 cm long, nearly oblong; primary ribs filiform, with few bristles, secondary ribs densely rigidly bristly.

Cultivated at some places. (GAJJAR, RATADIYU)

FLS & FRS : Dec.–Apr.

FOENICULUM Adans.

Foeniculum vulgare Mill. Gard. Dict. ed. 8. No. 1. 1768; FBI 2:695; C 1:609; Bailey 751; WI 4:52. ff. 30-31.

50–160 cm tall, simple or branched, strongly aromatic, glaucous-green herbs. Leaves pinnatisect, segments narrowly linear or filiform, 1–3 cm long. Flowers yellow. Fruits 0.4–0.6 cm long, oblong, ribbed, on drying pale-green.

Cultivated in many parts, extensively in north Gujarat; also an escape. (VALIARI)

FLS & FRS : Nov.–Apr.

PEUCEDANUM L.

Peucedanum grande Cl. in Hk. f in FBI 2:710. 1879; C 1:605; S 111; WI 7:330.

Perennial, tuberous, 0.8–1.2 cm tall undershrubs. Leaves radical and cauline, 1-2-pinnate, each pinna 3–5-foliolate; leaflets 7–20 × 4.5–13 cm, ovate-oblong or subglobose, glabrous. Flowers yellow. Fruits 0.8–1.2 cm long, obovate-oblong, narrowly winged, with prominent ridges.

Dangs (Malegaon-Saputara); occasional on hilly slopes. (BAPARI)

FLS & FRS : July-Aug.

PIMPINELLA L.

Key to species

1. Fruit glabrous.. .. ..*P. heyneana*

1. Fruit papillose, scabrid or pubescent :

   2. Lower cauline leaves simple.. .. ..*P. candolleana*

   2. Lower cauline leaves pinnate :

      3. Bracts 0.. .. .. *P. tomentosa*

      3. Bracts 3-7... .. ..*P. adscendens*

Pimpinella adscendens Dalz. in Kew Journ. Bot. 2:261. 1850; FBI 2:689; C 1:603; S 110.

Erect or ascending annuals. Leaves mostly radical, pinnate; leaflets 4–8-pairs, obovate or rotund-ovate, cauline leaves few, upper ones pinnatisect. Flowers white. Fruits ovoid, minutely pilose.

Environs of Bulsar (Ghadoi, Aak, Pardi); not common.

FLS & FRS : Nov.–May

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Pimpinella candollennn W & A. Prodr. 369. 1834; FBI 2:687; C 1:601.

Annuals, 30–60 cm tall. Lower cauline leaves simple, middle cauline 3-partite, uppermost 1–2-pinnatifid. Flowers white. Fruit ovoid, minutely muricate, mericarps prominently ridged.

Bulsar, on banks of river Auranga; rare.

FLS & FRS : Dec.–Feb.

Pimpinella heyneana Wall. ex Kurz in Journ. As. Soc. Bengal 46:115. 1877; FBI 2:684; C 1:601; S 109; WI 8:63.

30-140 cm tall annuals. Leaves 3-foliolate; leaflets 4–8× 2–4.5 cm, shallowly to deeply-lobed, each lobe ovate-lanceolate. Flowers white or pale-pink, minute. Fruits 0.1–0.2 cm across, glabrous, ovoid or subglobose, primary ridges faint.

Dangs; occasional. (NADGIOVA, KAVAR)

FLS : Sep.–Oct. *FRS* : Oct.–Nov.

Pimpinella tomentosa Dalz. ex Cl. in Hk. f. FBI 2:689. 1879; C 1:602.

60–100 cm tall, pubescent herbs, woody at base. Leaves 5–7 cm long, 2–3-pinnatipartite; segments ovate, pubescent. Flowers minute, white. Fruits 0.2–0.4 cm long, narrowly oblong, tomentose; ridges not distinct.

Dangs (Saputara); rare. (JANGLI JIRU)

FLS & FRS : Oct.–Nov.

SESILI L.

Sesili diffusum (Roxb. ex Sm.) Sant. & Wagh in Bull. bot. Surv. Ind. 5:108. 1963; WI 9:303. *Ligusticum diffusum* Roxb. ex Sm. in Rees, Cycl. 21:11. 1812. *Sesili indicum* W. & A. Prodr. 31. 1834; FBI 2:693.

10–20 cm tall, slender herbs. Leaves 2–3 pinnate, radical and cauline, hispid, oblong or oblong-lanceolate, 2-pinnate or pinnae pinnatisect, with ovate, pinnatifid pinnules. Flowers pink. Fruits oblong, ovate or suborbicular, often pale-yellow with thick ridges; vittae distant.

In moist beds of river Narmada at Broach and Chhota-udepur; rare.

FLS & FRS : April

TRACHYSPERMUM Link nom. cons.

Key to species and varieties

1. Leaves 2–3-pinnatisect; segments linear to filiform; fruit muricate, subhispid .. .. *T. ammi*

1. Leaves 2-pinnatisect; ultimate segments linear to lanceolate; fruit hispidulous or dotted or hispid-pubescent :

2. Fruit 0.15–0.2 cm long, hispid-pubescent; ridges distinct .. .. *T. roxburghianum*

2. Fruit 0.1–0.15 cm long, hispidulous or dotted; ridges faint .. .. *T. stictocarpum* var. *stictocarpum*

Trachyspermum ammi (L.) Sprague in Kew Bull. 1928 : 228. 1929; Buwalda in Fl. Males. 4:132. 1949. *Sison ammi* L. Sp. Pl. 252. 1753. *Ammi copticum* L. Mant. 1:56. 1767. *Trachyspermum copticum* (L.) Link, Enum. Pl. Hort. Berol. 1:267. 1821; S & J 26. *Carum copticum* (L.) Hiern in Fl Trop. Afr. 3:12. 1872; FBI 2:682; C 1:600.

30–60 cm tall, slender herbs. Leaves pinnately decompound; segments narrowly linear, glabrous. Flowers whitish or pinkish. Fruits hispidulous, prominently ridged.

Cultivated; often an escape (AJAMO)

FLS & FRS : Dec.–Mar.

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Trachyspermum roxburghianum (DC.) Craib in Fl. Siam. Enum. 1:788. 1831; Buwalda in Fl. Males 4:132. 1949. *Ptychotia roxburghiana* DC. Prodr. 4:109. 1830. *Carum roxburghianum* Kurz in Journ. As. Soc. Bengal 46(2):114. 1877; FBI 2:682; C 1:600.

30–60 cm tall, annual herbs. Leaves 2.5–8 cm long, variously pinnatisect; ultimate segments narrrowly linear. Flowers white, often with a pinkish tinge. Fruits 0.15–0.2 cm long, ovoid or subglobose, compressed, muricate or hispid.

Dangs, Rajpipla and Chhotaudepur, in forest undergrowth; not common.

FLS & FRS : Dec.–Jan.

Trachyspermum stictocarpum Wolff. var. **stictocarpum**; Ch & O 115. *Carum stictocarpum* Cl. in Hk. f. FBI 2:681. 1879; C 1:600.

40–90 cm tall herbs. Leaves 3–10 cm long, basal cauline ones 3–foliolate; leaflets 2.5–6.2×0.7–2 cm, ovate–lanceolate, upper ones gradually becoming pinnatifid to pinnatisect with narrowly linear or linear–lanceolate segments. Flowers white, minute. Fruits 0.1–0.2 cm long, ovoid.

In forest undergrowth or on old walls at Dangs, Rajpipla, Chhotaudepur, Pavagadh and Panchmahals; not common.

FLS & FRS : Sep.–Dec.

ZOSIMIA Hoffm.

Zosimia anethifolia DC. Prodr. 4:196. 1830.

Herbs, 30–75 cm tall, pubescent. Leaves 1–2 cm long, pinnately compound; segments linear–lanceolate or oblong–lanceolate. Flowers greenish–yellow, in compound umbels. Fruit elliptic or nearly orbicular, hairy, ribbed.

Bulsar–Ghadoi (Patel, R. M., 1971); rare, a patch seen on edges of a cultivated field.

FLS & FRS : Oct.–Dec.

ALANGIACEAE

ALANGIUM Lam. nom. cons.

Alangium salvifolium (L. f.) Wang. in Pfreich. 41:9. f. 2 A-E. 1910; WI 1:42. Pl. 8(3); Ch & O 116; S & J 26. *Grewia salvifolia* L. f. Suppl. 409. 1781. *Alangium lamarckii* Thw. Enum. 133. 1859; FBI 2:741; C 2:1.

3–10 m tall, thorny trees, with ash–coloured, rough and faintly fissured bark. Leaves 2.7–15×1.5–5.5 cm, elliptic–oblong, elliptic–lanceolate or oblong–lanceolate. Flowers 2–2.5 cm long, greenish–white, fascicled, axillary or on old wood. Berries 1.3–1.6 cm long, ovoid, ellipsoid or nearly globose, glabrous, smooth, violet to deep–purple.

Throughout; common. (ANKOL, ANKOLI)

FLS : Feb.–Apr. *FRS :* Apr.–June

RUBIACEAE

Key to genera

1. Plants unarmed :
   2. Flowers in globose heads :
      3. Flowers yellow; ovules more than two in each cell; fruit a capsule :
         4. Calyx limb 5–lobed; stigma clavate; leaves distinctly cordate at base .. .. *Adina*
         4. Calyx limb entire, truncate; stigma mitriform; leaves truncate, rounded or subacute at base .. *Mitragyna*
      3. Flowers white; ovule one in each cell; fruit a syncarp .. .. *Morinda*
   2. Flowers in dense, paniculate, pendent spikes .. *Hymenodyction*
   2. Flowers neither in globose heads nor in pendent spikes :
      5. Ovules more than 2 in each loculus :
         6. Shrubs or small trees .. .. .. *Wendlandia*
         6. Herbs :
            7. Creeping; corolla lobes with a tooth on each side .. .. *Dentella*

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7. Erect or diffuse :

8. Seeds few, plano-convex or globose with a large ventral cavity .. .. .. *Neanotis*

8. Seeds numerous, angular or subglobose :

9. Flowers at the end of capillary branches; seeds subglobose coarsely pitted .. .. *Thecagonum*

9. Flowers not as above; seeds angled, smooth:

10. Corolla tube long; flowers pale-blue; branches and fruit scabrid with whitish points .. .. *Kohautia*

10. Corolla tube short; flowers white or with a pale-pink tinge or purple; branches and fruits smooth .. .. *Oldenlandia*

5. Ovule solitary in each cell :

11. Trees or shrubs :

12. Corolla twisted; ovary 2-celled; fruit berry :

13. Style shortly exserted, 2-branched....*Ixora*

13. Style much exserted, entire.. .. ..*Pavetta*

12. Corolla lobes valvate; ovary 3-5-celled; fruit a capsule.. .. .. *Spermadictyon*

11. Herbs :

14. Fruit of 2 indehiscent cocci.. .. *Hydrophylax*

14. Fruit of 2 cocci, one or both cocci dehiscent.. .. ..*Borreria*

1. Plants armed :

15. Ovules more than 2 in each cell :

16. Leaves petiolate, fascicled at ends of branches; ovary 2-celled; ovules on axillary placentas .. *Xeromphis*

16. Leaves sessile, borne along branches; ovary one-celled; ovules on parietal placentas .. .. *Gardenia*

15. Ovule solitary in each cell :

17. Ovary 2-celled .. .. *Canthium*

17. Ovary 3-5-celled .. .. *Meyna*

ADINA Salisb.

Adina cordifolia (Roxb.) Bth. & Hk. f. ex Brandis, For. Fl. 263. t. 33. 1874; C 2:7; WI 1:32. Pl. 9(1); Bor 291; S & J 26; S 112. *Nauclea cordifolia* Roxb. Pl. Cor. 1:40. t. 53. 1796.

Deciduous trees, 8–20 m tall, with grey or light-black, longitudinally fissured bark. Leaves 2–26 × 1.5–25.5 cm, broadly ovate to sub-orbicular, appressed-pubescent beneath. Flowers yellow, in 1.5–2 cm across, globose, axillary heads. Capsule 0.4–0.6 cm long, obconical, pubescent. Seeds about 6 in each coccus, oblong, brown, minutely hairy, winged.

Throughout (except Kutch), in deciduous forests. (HALDARVO, HALDU, HALDAVAN)

FLS : July–Dec. *FRS :* Oct.–Mar.

BORRERIA G. F. W. Meyer nom. cons.

Key to species

1. Plants procumbent or suberect; flowers rosy-purple or lilac, 0.6–1 cm long, in axillary clusters.. .. ..*B. articularis*

1. Plants erect; flowers white, 0.2–0.4 cm long, in terminal and axillary clusters.. .. ..*B. stricta*

Borreria articularis (L. f.) F. N. Will. in Bull. Herb. Boiss. (II) 5:956. 1905; Ch & O 117; S & J 26; S 121. *Spermacoce hispida* L. Sp. Pl. 102. 1753; FBI 3:200; C 2:53. *Spermacoce articularis* L. f. Suppl. 119. 1781 (excl. syn Rumph.). *Borreria hispida* (L.) K. Schum. in Engl. & Prantl, Pflam. 4 (4): 144. 1891 (non Spruce ex K. Schum. 1888); WI 1:207.

Branched or unbranched, procumbent or suberect herbs, hispidly hairy in younger parts. Leaves 0.8–4 × 0.4–0.8 cm,

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elliptic or elliptic-lanceolate, pubescent. Capsule 0.2–0.3 cm long, oblong, apiculate. Seeds 0.15–0.2 cm, ellipsoid-oblong, ventrally grooved.

Throughout; common. (GANTHIYU, KHARSAT SHANKHLO)

FLS & FRS : July–Jan.

Borreria stricta (L. f.) Schum. in Engl. & Prantl, Pfam. 4 (4): 143. 1891; Ch & O 118; S & J 26; S 121. *Spermacoce stricta* L. f. Suppl. 120. 1781; FBI 3:200; C 2:52.

Herbs, 10–45 cm tall. Leaves 1.2–6×0.3–0.6 cm, subsessile, linear to linear-lanceolate, minutely scabridly hairy. Capsule 0.2–0.25 cm long, oblong, apiculate, pubescent in upper half. Seeds 0.15–0.2 cm long, oblong, reddish-brown, ventrally grooved.

Throughout (except Kutch); common.

FLS & FRS : July–Nov.

CANTHIUM Lam.

Canthium parviflorum Lam. Encycl. Meth. Bot. 1:602. 1785; FBI 3:136. *Plectronia parviflora* Bedd. For. Man. in Flor. Sylv. cxxxiv-5. 1874; C 2:35.

Shrubs. Leaves 2–4.5×1.2–3 cm, ovate, obovate or suborbicular, glabrous. Flowers many, in pedunculate cymes or sometimes fascicled. Drupes 1–1.5 cm long, oblong-ellipsoid, compressed, didymous.

Listed by Saxton & Sedgwick (1918) from north Gujarat, under *Plectronia parviflora* Bedd.; according to them it was common.

FLS : Aug.–Oct. *FRS :* Sep.–Dec.

DENTELLA Forst.

Dentella repens (L.) Forst. Char. Gen. 26. t. 13. 1776; FBI 3:42; C 2:12; WI 3:35; S & J 26; S 115. *Oldenlandia repens* L. Mant. 1:40. 1767.

Much branched, prostrate herbs, often rooting at nodes. Leaves 0.2–1 cm long, subsessile, lanceolate or spathulate, glabrous or thinly hairy. Flowers minute, white, axillary, solitary.

Throughout in drying moist ground (except Kutch); not common.

FLS & FRS : Sep.–Apr.

GARDENIA L.

Key to species and varieties

1. Armed; flowers dimorphic, male flowers fascicled, female flowers solitary; placentas 5–6 :
   2. Leaves elliptic-obovate or obovate-oblong or obovate-rhomboid, pubescent beneath .. .. *G. turgida* var. *turgida*
   2. Leaves oblong or subspherical, velvety-tomentose beneath .. .. *G. turgida* var. *montana*
1. Unarmed; flowers not dimorphic; placentas 2 .. .. *G. resinifera*

Gardenia resinifera Roth, Nov. Pl. Sp. 150. 1821; S & J 26; S 118. *Gardenia lucida* Roxb. Fl. Ind. 2:553. 1824; FBI 3:115; C 2:30.

3–6 m tall shrubs or small trees, with greyish or light black, smooth bark. Leaves 4–30×3.5–8 cm, glabrous. Flowers white, fragrant, axillary, solitary. Fruits 1.5–2.5×0.8–1 cm, ellipsoid, nearly globose or obovoid, glabrous, smooth. Seeds many, light-red, glabrous, rectangular or subreniform, compressed.

Sometimes planted in gardens, but wild in Dangs and Chhotaudepur forests; rare (PENDRI, JANGLI CHAMPO: DIKAMALI).

FLS : Oct.–Jan. *FRS :* Dec.–Feb.

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Gardenia turgida Roxb. var. **montana** (Roxb.) Hk. f. in Hk. f. FBI 3:118. 1880; C 2:29; Saxton in Rec. bot. Surv. India 6(9): 254. 1922. *Gardenia montana* Roxb. Fl. Ind. 1:107. 1832.

Reported by Saxton (1922) from north Gujarat; included here on his authority.

Gardenia turgida Roxb. var. **turgida**. *Gardenia turgida* Roxb. Hort. Beng. 15. 1814 (nomen) and Fl. Ind. 1:711. 1832; FBI 3:118; WI 4:111; S & J 26.

Deciduous trees, 5–7 m tall, with smooth, yellowish – to blackish-brown bark. Leaves 3–7.5 × 2–4.3 cm, sessile. Flowers creamy-white or yellow, fragrant, fascicled at ends of leafless branches. Fruits 4.5–6 cm broad, ovoid or nearly globose, with greenish-grey, rough rind.

Frequent in scrub forest; rare in deciduous forest; so far not reported or collected from Kutch. (GANGDI, TADHOLI, FINDARKO)

FLS : Mar.–May *FRS :* Apr.–June.

HYDROPHYLAX L. f.

Hydrophylax maritima L. f. Suppl. 126. 1791; FBI 3:199; C 2:51; S & J 26; WI 5:148.

Prostrate or creeping, glabrous herbs, rooting at nodes. Leaves 1–1.5 × 0.6–0.8 cm, sessile, ovate, ovate-oblong or obovate-oblong, fleshy, smooth or papillose. Flowers purple, sessile or subsessile, axillary, solitary. Furits 1.2–1.8 cm long, 1–2-loculate, bluntly ellipsoidal, prominently winged. Seeds linear-oblong, ventrally grooved.

Kutch and Saurashtra, along sea-coast.

FLS & FRS : Oct.–Nov.

HYMENODICTYON Wall. nom. cons.

Hymenodictyon excelsum (Roxb.) Wall. in Roxb. Fl. Ind. 2:149. 1824; FBI 3:35; C 2:9; WI 5:149. f. 94; S & J 26; S 113. *Chinchona excelsa* Roxb. Pl. Cor. 2: t. 106. 1798.

9–15 m tall, deciduous trees, with smooth, ash-coloured bark. Leaves 10–30 × 5.5–16 cm, ovate-elliptic or obovate-oblong, membranous, pubescent. Flowers pale-greenish-white, fascicled, fascicles forming 8–15 cm long, terminal and axillary panicles. Fruit 1.5–1.7 × 0.7–1 cm, ellipsoidal, brown.

In deciduous forests of Dangs, Chhotaudepur, Saurashtra (Barda and Girnar) and in scrub forests in north Gujarat. (BHAMMAR CHAL, ROGAN KOKADIO, KADWAI, PARI-ANI, MADH-MAHUDO, BOISAL).

FLS : July–Aug. *FRS :* Sep.–Oct.

IXORA L.

Key to species

1. Flowers red; corolla tube 2.5–4 cm long .. .. *I. coccinea*

1. Flowers white; corolla tube not more than 2 cm long :

2. Corolla tube 0.6–1 cm long; flower buds round .. .. *I. brachiata*

2. Corolla tube 1–1.8 cm long; flower buds ellipsoidal .. .. *I. arborea*

Ixora arborea Roxb. ex Sm. in Rees, Cyclop. 19. no. 5. 1811; WI 5:275. f. 145; Ch & O 119; S & J 26; S 119. *Ixora parviflora* Vahl, Symb. Bot. 3:11. t. 52. 1794 (non Lam. 1791); FBI 3:142; C 2:39.

2.5–4 m tall shrubs or small trees. Leaves 7–17 × 3–6 cm, coriaceous, glabrous, elliptic-oblong or ovate-oblong, glabrous. Flowers white, fragrant, in terminal, corymbose cymes. Berries 0.6–0.8 cm broad, globose. Seeds brown.

Pavagadh, north Gujarat (Modasa) and Saurashtra. (NAVERI)

FLS & FRS : Mar.–Apr.

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Ixora brachiata Roxb. Hort. Beng. 10.1814 (nomen) & Fl. Ind. 1:391. 1820; FBI 3:142; C 2:39; S & J 26; S 118.

4–5 m tall, straight or crooked trees. Leaves 4.5–19×1.9–7.5 cm, opposite, rarely whorled, obovate-oblong, elliptic-oblong or lanceolate. Flowers white, in 5-13 cm long, terminal panicles. Berries 0.5-0.8 cm in diam., globose, dark-purple or nearly black.

Dangs, Chhotaudepur, Panchmahals and Saurashtra; not common. (GARBALE)

FLS & FRS : Feb.–June

Ixora coccinea L. Sp. Pl. 110. 1753; FBI 3:145; C 2:40; WI 5:276.

60–200 cm tall shrubs. Leaves 3.7–12×2–6.5 cm, elliptic-oblong, sometimes obovate. Flowers red, scarlet or yellow, in 4–10 cm across, terminal, paniculate cymes. Berries 0.6–0.8 cm across, rounded, globose, glabrous, smooth, orange or purple.

Cultivated in gardens; seldom an escape (Saurashtra). (RATINEVARI, RATO OKHO)

FLS & FRS : Throughout the year.

KOHAUTIA Cham. & Schlecht.

Kohautia aspera (Heyne ex Roth) Bremek. in Verh. Ned. Akad. Wett. (II) 48 (2) : 113. 1952; S & J 26. *Heylandia aspera* Heyne ex Roth, Nov. Pl. Sp. 94. 1821. *Oldenlandia aspera* (Heyne ex Roth) DC. Prodr. 4:428. 1830; FBI 3:68; C 2:18.

15–30 cm tall, erect herbs, with stem and branches studded with white dots. Leaves 1.2–4.5×0.3–0.5 cm, linear, linear-lanceolate. Flowers white, in terminal, paniculate cymes. Capsule 0.3–0.4 cm across, rounded, didymous. Seeds obconical, subglobose or angular, dark-brown, smooth, glabrous.

Rajpipla, Khedbrahma, Saurashtra and Kutch; rare.

FLS & FRS : Aug.–Dec.

MEYNA Link

Meyna laxiflora Robyns in Bull. Jard. Bot. Brux. 11:228. 1928; WI 6:353. f. 131; S & J 26; S 118. *Vangueria spinosa* Roxb. Hort. Beng. 15. 1814 (nomen) & Fl. Ind. 1:536. 1832; FBI 3:136; C 2:36.

Large shrubs or small trees, with light-black, smooth bark. Leaves opposite or whorled, 3.5–14×1.2–10 cm, elliptic-oblong or subglobose, glabrous. Flowers greenish-yellow, 0.8–1 cm across, in axillary cymes or fascicled, on leafless wood. Fruits 2.5–4 cm across, nearly globose, fleshy, smooth, glabrous, yellow when ripe.

Dangs, Rajpipla and Saurashtra; not common. (ALI, ALU, ALIV, PHALKHADO, GONDADI).

FLS : Dec.-June *FRS* : June–Aug.

MITRAGYNA Korth. nom. cons.

Mitragyna parvifolia (Roxb.) Korth. Obs. Naucl. Ind. 19. 1839; C 2:8; WI 6:393. f. 144; Ch & O 118; S & J 26; S 112. *Nauclea parvifolia* Roxb. Pl. Cor. 1:40. t. 12. 1795. *Stephegyne parvifolium* Korth. Verh. Nat. Ges. Bot. 161. 1840; FBI 3:25.

8–15 m tall, deciduous trees; bark grey, smooth, exfoliating in small scales. Leaves 3.5–17×2.1–16.5 cm, ovate, elliptic-oblong, obovate or nearly glabrous. Flowers white, turning yellow, in 1–1.4 cm across, globose, axillary and terminal heads. Capsules 0.25-0.3 cm long, glabrous, cuneate, distinctly ribbed. Seeds minute, brown, nearly smooth, winged.

Throughout in deciduous and scrub forests; sometimes also planted in gardens. (KALAM, KADAMB)

FLS : Apr.–Aug. *FRS* : Dry ones for best part of the year on trees.

MORINDA L.

Morinda tomentosa Heyne ex Roth, Nov. Pl. Sp. 147. 1821; Ch & O 119; S & J 26. *Morinda tinctoria* Roxb. var. *tomentosa*

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(Heyne ex Roth) Hk. f. in Hk. f. FBI 3:156. 1880; C 2:43. *Morinda tinctoria* Roxb. Hort. Beng. 15. 1814 (nomen) & Fl. Ind. 1:543. 1832; WI 6:242 (omne p.p.).

8–13 m tall trees, with blackish–brown, rough, irregularly fissured bark. Leaves 6.5–24×3–15 cm, elliptic, elliptic–oblong or obovate–oblong, tomentose. Flowers white, in fleshy, globose heads. Fruits 2–3 cm across, of coalescent drupes, bright–glaucous–green. Seeds oblong or obovoid, pale–to dark–brown, rough.

Throughout (except Kutch); common in dry deciduous forests. (AL, ALI)

FLS: Mar.–Nov. *FRS*: Dried fruits for most part of the year.

NEANOTIS W. H. Lewis

Key to species

1. Cymes corymbose; flowers white .. .. *N. rheedii*
1. Cymes clustered; flowers white or purple .. *N. foetida*

Neanotis foetida (Hk. f.) Lewis in Ann. Miss. Bot. Gardn. 53:38. 1966. *Hedyotis foetida* Dalz. in Journ. Bot. 2:134. 1850 (non Forst.). *Anotis foetida* Hk. f. in Hk. f. FBI 3:74. 1880; C 2:22.

6–15 cm tall, glabrous herbs. Leaves 1.6–4×0.2–0.5 cm, linear–lanceolate, sessile or subsessile, minutely papillose above. Cymes terminal, compact. Capsules 0.2–0.4 cm across, didymous, globose, glabrous. Seeds few, elliptic or oblong, flat, punctate, ventrally grooved.

Dharampur, Bulsar, Dang and Pavagadh, among grasses; common.

FLS & FRS: July–Dec.

Neanotis rheedii (Wall. ex W. & A.) W. H. Lewis in Ann. Miss. Bot. Gard. 53(1):40. 1966. *Hedyotis rheedii* Wall. ex W. & A.

Prodr. 509. 1834. *Anotis rheedii* (Wall. ex W. & A.) Hk. f. in Hk. f. FBI 3:73. 1880; C 2:21.

Annual, slender, glabrous herbs. Leaves 1.5–5.5×0.6–2.5 cm, ovate, membranous, sparsely hairy. Flowers minute, in axillary and terminal cymes. Seeds more or less ellipsoidal, black, reticulate, deeply excavated on ventral face.

Dharampur, Dangs and Chhotaudepur, rare.

FLS & FRS: Aug.–Oct.

OLDENLANDIA L.

Key to species

1. Peduncle axillary, 1–4–flowered from the lower or all axils:
   2. Leaves linear; bases of calyx teeth not touching in fruit:
      3. Top of the capsule flat .. .. *O. corymbosa*
      3. Top of the capsule rounded, protruded .. *O. herbacea*
   2. Leaves elliptic; bases of calyx teeth touching in fruit .. .. *O. pumila*
1. Peduncles many–flowered, chiefly from the axils:
   4. Flowers in umbels; pedicels very short .. .. *O. umbellata*
   4. Flowers on long, capillary pedicels or in slender panicles .. .. *O. affinis*

Oldenlandia affinis DC. Prodr. 4:428. 1830; S & J 26. *Oldenlandia dichotoma* Hk. f. in Hk. f. FBI 3:67. 1880; C 2:17.

20–40 cm tall, glabrous or sparsely hairy herbs. Leaves 1.5–3×0.1–0.5 cm, linear to linear–lanceolate, hairy, sessile. Flowers 0.5–0.7 cm long, in terminal and axillary, slender panicles. Capsule 0.3–0.5 cm across, globose, somewhat didymous, hairy. Seeds numerous, pale–brown, minute, angular.

Dangs, Chhotaudepur and Kutch; not common.

FLS & FRS: Aug.–Oct.

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Oldenlandia corymbosa L. Sp. Pl. 119. 1753; FBI 3:64; C 2:15; Ch & O 117: S & J 27; S 115. *Hedyotis corymbosa* Lam. Encycl. Meth. Bot. 1:272. 1792; WI 5:15. f. 11.

Annual, erect or diffuse, 10–30 cm tall, glabrous herbs. Leaves 1–2 cm long, narrowly linear, glabrous. Cymes axillary. Capsule 0.2–0.5 cm long, didymous, globose, smooth, glabrous. Seeds minute, angular, dark-brown.

Throughout, common. (PARPAT, PARPATI)

FLS & FRS : Throughout the year.

Oldenlandia herbacea (L.) Roxb. Hort. Beng. 11. 1814 (nomen) & Fl. Ind. 1:424. 1820; C 2:16; S & J 27. *Hedyotis herbacea* L. Sp. Pl. 102. 1753; WI 5:15. *Oldenlandia heynii* G. Don, Gen. Syst. 3:531. 1834; FBI 3:65.

Erect, 7–40 cm tall, slender, glabrous herbs. Leaves 1.5–4 ×0.25–0.5 cm, linear or linear-lanceolate. Flowers pale-or bright-purple, minute, axillary. Capsule 0.2–0.6 cm across, ovoid or subglobose, somewhat didymous, glabrous. Seeds many, ellipsoidal.

Dangs, Saurashtra, Kutch; not common. (PARPAT PARPATI)

FLS & FRS : Oct.

Oldenlandia pumila (L. f.) DC. Prodr. 4:425. 1830; S & J 27. *Hedyotis pumila* L. f. Suppl. 119. 1781. *Oldenlandia crystallina* Roxb. Fl. Ind. 1:422. 1820; FBI 3:65; C 2:16.

Prostrate or diffuse, glabrous herbs. Leaves 1.2–3×0.4–0.6 cm, nearly sessile, glabrous, elliptic or elliptic-lanceolate. Flowers axillary, solitary or two, on glabrous peduncle. Capsule 0.3–0.5 cm broad, glabrous, obovate or pyriform. Seeds numerous, minute, angular, brown.

Bulsar, Dangs, Chhotaudepur, Baroda and Saurashtra; not common, among grasses.

FLS & FRS : Aug.–Oct.

Oldenlandia umbellata L. Sp. Pl. 119. 1753; FBI 3:66; C 2:17; S & J 27. *Hedyotis umbellata* Lam. Tabl. Encyl. 1:272. 1792; WI 5:16. f. 12.

15–30 cm tall, suberect or diffuse herbs. Leaves 2.8–4.5× 0.3–0.6 cm, whorled, linear to linear-lanceolate. Flowers white, in axillary, umbellate cymes. Capsule 0.15–0.2 cm, sparsely scabrid. Seeds numerous, black, angular, punctate.

Ahmedabad, Saurashtra and Kutch; rare.

FLS & FRS : Aug.–Oct.

PAVETTA L.

Pavetta crassicaulis Bremek. in Fedde, Repert. 37:112. 1934 & 47:25. 1939; S 120. *Pavetta indica* auct. non L. 1753; FBI 3:150; C 2:41; WI 6:282.

2.5–3.5 m tall shrubs; bark smooth. Leaves 7.5–20×3–8 cm, elliptic-oblong or obovate-oblong, sparsely hairy on nerves beneath. Flowers pale-blue to almost white, in terminal, panicled cymes. Berries 0.5–0.6 cm across, globose, black, smooth.

Dangs, rare. (PAPAT)

FLS : Nov.–Dec.

SPERMADICTYON Roxb.

Spermadictyon suaveolens Roxb. Pl. Cor. 3:32. t. 236. 1819; S 120. *Hamiltonia suaveolens* Roxb. Hort. Beng. 15. 1814 (nomen) & Fl. Ind. 1:554. 1832; FBI 3:197; C 2:51; WI 5:6. f. 4.

1.5–3 m tall trees, with greyish or pale-brown, faintly longitudinally fissured bark. Leaves 4.5–18.4×2.5–7.5 cm, ovate, elliptic or lanceolate, glabrous or sparsely appressed-hairy. Flowers pure white or very pale-blue, scented, numerous, in axillary and terminal, 2–10 cm long, paniculate cymes. Fruits 0.3–0.4 cm long, ellipsoid, black, glabrous. Seeds glabrous, triangular.

Scanned by CamScanner

In deciduous forests of Dangs, Rajpipla, Chhotaudepur and Panchmahals; not common.

FLS : Aug.–Dec. *FRS* : Sep.–Mar.

THECAGONUM Babu

Thecagonum ovalifolium (Cav.) Babu in Bull. bot. Surv. India 11:214. 1969. *Hedyotis ovalifolia* Cav. Icon. 6:52. 1801. *Oldenlandia nudicaulis* Roth, Nov. Pl. Sp. 95. 1821; FBI 3:70; Ch & O in Ind. For. 92:533–535. 1966.

An erect, hairy annual, 5–15 cm tall. Leaves shortly petioled, 2–5 cm long, ovate or elliptic, obtuse. Flowers white. Capsules hemispheric, 0.25–0.3 cm across. Seeds dark-brown, obscurely angled.

Dangs (collected by Saxton)

FLS & FRS : Aug.–Sep.

WENDLANDIA Bartl. ex A. P. de Candolle nom. cons.

Wendlandia heynei (R. & S.) Santapau & Merchant in Bull. bot. Surv. India 3:110. 1961; S 114. *Rondelatia heynei* R. & S. 5:234. 1819. *Rondeletia exserta* Roxb. Hort. Beng. 14. 1814 (nomen) & Fl. Ind. 2:135. 1824. *Wendlandia exserta* (Roxb.) DC. Prodr. 4:411. 1830; FBI 3:37; C 2:10.

Deciduous, 2.5–4 m tall shrubs or small trees. Leaves 7–16 ×4–8 cm, lanceolate or ovate-lanceolate, grey-tomentose beneath. Flowers pale-blue, in 10–15 cm long, terminal panicles. Capsule ±0.2 cm broad, globose, tomentose. Seeds black, minute, rugose.

So far only in Dangs; not common.

FLS & FRS : Mar.–April, sometimes upto December

XEROMPHIS Raf.

Key to species

1. Leaves obovate or obovate-oblong; flowers more than 2.5 cm across; corolla glabrous outside.. .. ..*X. uliginosa*
1. Leaves elliptic or elliptic-obovate; flowers not more than 2.5 cm across; corolla pubescent outside.. .. ..*X. spinosa*

Xeromphis spinosa (Thunb.) Keay in Bull Jard. Bot. Brux. 28:37. 1958; S & J 27; S 117. *Gardenia spinosa* Thunb. Diss. Gard. no. 7. 1780. *Randia spinosa* (Thunb.) Bl. Bijdr. 981. 1826; Ch & O 119; WI 8:360. t. 134. *Randia dumetorum* Lam. Tab. Encycl. 2:227. 1792; FBI 3:110; C 2:27.

Armed, deciduous shrubs, 1–3.5 m tall, with dark-brown or black, rough bark. Leaves 1.2–10×0.4–4.5 cm, fascicled, at ends of branches, elliptic or obovate, subcoriaceous, glabrous, but for pubescent nerves. Flowers creamy-white or pale-yellow, fragrant. Fruits 2–2.5 cm across, ovoid or nearly globose, woody, smooth or faintly longitudinally ribbed. Seeds numerous, compressed, angular, glabrous, smooth.

Throughout in forests (MINDHAL, MINDHOL, MEDHELO)

FLS : July–Sep. *FRS* : Sep.–Dec.

Xeromphis uliginosa (Retz.) Maheshwari in Bull. bot. Surv. India 5:129. 1963; S & J 27. *Gardenia uliginosa* Retz Obs. 2:14. 1781. *Randia uliginosa* (Retz.) DC. Prodr. 4:386 1830; FBI 3:110; C 2:27; WI 8:363.

Shrubs or small trees, 2–5 m tall, with reddish-brown, scaly bark. Leaves 4.5–21.5×1.5–7 cm, crowded at ends of branches. Flowers solitary or 2–3-fascicled, at ends of short branches, white, at length pale-yellow. Fruit 2–3 cm across, ovoid or spherical, smooth, yellowish-brown. Seeds numerous, compressed, glabrous, smooth.

Rajpipla, Pavagadh, Panchmahals, Saurashtra and Kutch; not common. (GENGDA, GANGAD, GANGEDA).

FLS & FRS : Aug.-Oct.

ASTERACEAE (COMPOSITAE)

Key to genera

1. Florets all ligulate:
   2. Flowers bright-blue or bluish-purple; pappus extremely short of reddish or green scales.. .. ..*Cichorium*

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2. Flowers usually yellow, seldom pink or blue; pappus of simple hairs :
   3. Achenes beaked .. .. *Lactuca*
   3. Achenes not beaked :
      4. Achenes columnar; heads cylindric .. *Launaea*
      4. Achenes ovoid or obovoid; heads ovoid, campanulate or cylindric .. .. *Sonchus*

1. Florets all tubular or atleast disc florets tubular :
   5. Fruits spinous :
      6. Achenes stellately arranged .. .. *Acanthospermum*
      6. Achenes not as above, 2, enclosed in spinescent fruit.. .. .. *Xanthium*
   5. Fruits not spinous :
      7. Heads spinous :
         8. Leaves spinous, cottony-white-tomentose beneath; heads globose; florets very pale-blue .. *Echinops*
         8. Leaves not as above; heads ovoid or globose; florets bright-purple, pale-yellow or creamy-yellow :
            9. Heads bright-purple :
               10. Heads homogamous; florets all tubular, fertile; achenes smooth, faintly ribbed .. .. *Tricholepis*
               10. Heads heterogamous; outer florets neuter; achene strongly 5-15-ribbed .. *Amberboa*
            9. Heads creamy-yellow to pale-yellow .. *Dicoma*
      7. Heads not spinous :
         11. Florets of one colour :
            12. Florets white, creamy-white, greenish-white, or very pale-blue or bluish-white :
               13. Heads compound, axillary, with two large bracts; pappus of 2 scales.. .. *Cicerbita Caesulia*
               13. Heads simple. not as above; pappus not of scales :
                  14. Leaves alternate :
                     15. Heads collected in globose or ovoid clusters.. .. *Anaphalis*

15. Heads not forming globose or ovoid clusters :
    16. Head solitary, purple, but florets white.. .. .. *Sphaeranthus*
    16. Heads not solitary, white :
        17. Pappus of scales or awns.. .. .. *Parthenium*
        17. Pappus 0.. .. .. *Artemisia*
14. Leaves opposite :
    18. Heads 1-flowered. in globose clusters; involucral bracts forming fimbriate or toothed cup or ring .. .. *Lagascea*
    18. Heads and involucral bracts not as above :
        19. Heads heterogamous; outer florets ligulate, central tubular; ligule of ray florets small. :
            20. Pappus 0 .. .. *Eclipta*
            20. Pappus of 2-5 hairs.. .. .. *Blainvillea*
        19. Heads homogamous; florets all tubular :
            21. Anthers minutely apiculate at tip .. .. *Adenostemma*
            21. Anthers appendiculate at tip.. .. *Ageratum*

12. Florets blue, bluish-purple, purple, violet or brownish-red :
    22. Heads homogamous :
        23. Anthers tailed :
            24. Leaves gland-dotted beneath; heads blue to bluish-purple; achenes not ribbed.. *Eupatorium*
            24. Leaves not gland-dotted beneath; heads bright-rosy-purple; achenes ribbed .. .. *Goniocaulon*
        23. Anthers not tailed :
            25. Leaves cauline :
                26. Leaves whitish-tomentose beneath; heads terminal, solitary; pappus short, fugacious .. .. *Centratherum*
                26. Leaves not whitish-tomentose beneath; heads in paniculate cymes; pappus long, more or less persistent.. .. .. *Vernonia*

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25. Leaves radical and cauline :
    27. Heads 2–5 clustered; each cluster subtended by 3 large, stiff, foliaceous bracts; anthers sagittate; rigid perennials .. .. *Elephantopus*
    27. Heads in open corymbs but not forming clusters; anther bases obtuse; slender herbs.. .. .. *Emilia*
22. Heads heterogamous :
    28. Ray florets ligulate.. .. .. .. *Coreopsis*
    28. Ray florets eligulate :
        29. Leaves pinnatifid; pappus 0 .. *Cyathocline*
        29. Leaves entire; pappus copious :
            30. Shrubs or undershrubs; involucral bracts dry; styles of bisexual flowers undivided .. .. *Pluchea*
            30. Herbs; involucral bracts herbaceous; style of bisexual flowers slender :
                31. Anthers tailed.. .. .. *Blumea*
                31. Anthers not tailed.. .. *Laggera*
12. Heads yellow, orange-yellow, brownish-yellow :
    32. Leaves variously lobed, at times compound:
        33. Pappus of 2–4 retrosely hispid, spreading awns:
            34. Leaves opposite; leaf segment not filiform.. .. .. *Bidens*
            34. Leaves alternate or the lower opposite; leaf segments filiform or very narrowly linear :
                35. Style arms with long, hairy appendages; plants inodorus :
                    35a. Leaves mostly cauline; achenes smooth, not awned *Chrysanthellum*
                    35a. Leaves mostly radical; achenes deeply grooved and with two persistent awns.....*Glossogyne*
                35. Style arms truncate, penicillate or with short appendages; plants smelling of dill or sowa.. .. .. *Glossocardia*

33. Pappus copious of setose hairs.. .. *Hymenatherum*
33. Pappus of 3–10 unequal scales or bristles....*Tagetes*
32. Leaves simple, undivided :
    36. Leaves lower or all opposite :
        37. Achenes of two types :
            38. Achenes of ray florets compressed, winged; wings lacerate, those of disc florets compressed or triquetrous.. .. .. *Synedrella*
            38. Achenes of ray florets cuneiform, triquetrous, but not winged; those of disc florets triquetrous or compressed.. .. .. *Blainvillea*
        37. Achenes of one type :
            39. Exterior bracts herbaceous, linear-cuneate, spreading.. .. .. .. *Siegesbeckia*
            39. Bracts not as above :
                40. Heads axillary, sessile .. .. *Flaveria*
                40. Heads terminal, if axillary, not sessile :
                    41. Heads eligulate, solitary, terminal, on a long stalk .. .. *Spilanthes*
                    41. Heads with ray florets, in terminal paniculate cymes or terminal and axillary, pedunculate :
                        42. Achenes longitudinally ribbed; pappus 0.. .. .. *Guizotia*
                        42. Achenes not ribbed; pappus a ciliolate ring.. .. *Wedelia*
    36. Leaves alternate :
        43. Pappus 0 or if present, minute, cupular :
            44. Pappus 0; heads nearly sessile; achenes 4-angled or gibbous :
                45. Prostrate herbs; achenes 4-angled.. .. .. *Centipeda*
                45. Erect herbs; achenes gibbous.. .. .. *Sclerocarpus*

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44. Pappus cupular; head stalked; achenes flat or subterete.. .. ..*Grangea*

43. Pappus of ray florets 0; those of disc florets many : .. .. *Vicoa*

43. Pappus hairs of ray florets and disc florets many:

45. Ray florets ligulate, large .. .. .. *Pulicaria*

45. Ray florets filiform, small :

46. Plants woolly-greyish-white tomentose ... . *Gnaphalium*

46. Plants not as above :

47. Leaves whitish-tomentose-beneath .. *Senecio*

47. Leaves not as above :

48. Shrubs or undershrubs involucral bracts dry.. .. ..*Pluchea*

48. Herbs; involucral bracts herbaceous :

49. Anthers tailed.. .. ..*Blumea*

49. Anthers not tailed :

50. Leaves decurrent or auricled at base.. .. .. .. *Laggera*

50. Leaves neither decurrent nor auricled .. .. *Conyza*

Florets

11. Heads of two colours :

51. Head solitary on a very long peduncle; anthers sagittate; pappus paleaceous, of numerous plumoso-ciliate bristles; achene sericeo-villous.. .. ..*Tridax*

51. Heads solitary or variously corymbose or panicled; anthers not sagittate; pappus of many long hairs; achene not as above.. .. ..*Erigeron*

ACANTHOSPERMUM Schrank.

Acanthospermum hispidum DC. prodr. 5:222. 1836; Ch & O 132; S & J 27.

Dichotomously branched, suffruticose, 30-60 cm tall herbs. Leaves 0.8-7×0.6-3.3 cm, sessile or subsessile, obovate or spathulate, appressed-hairy. Heads pale-yellow, solitary, axillary or between forks of branches pedunculate. Achenes 4-8, obconical, stellately arranged, glabrous, with hooked spines.

Throughout (except Kutch). scattered or gregarious; native of Central America.

FLS & FRS : Aug.-Feb.

ADENOSTEMMA Forst.

Adenostemma lavenia (L.) O. Ktze. Rev. Gen. Pl. 3:304. 1891; S 124. *Verbesina lavenia* L. Sp. Pl. 902. 1753. *Adenostemma viscosum* Forst. Char. 90.1776; FBI 3:242; C 2:69.

30-90 cm tall herbs, glandular-hairy in younger parts. Leaves 2.5-18×1.5-9.5 cm, opposite, broadly ovate, ovate-lanceolate or ovate-oblong, glabrous. Heads 0.5-1 cm across, white, in terminal, lax panicles. Achenes 0.2-0.4 cm long, blackish-brown, glandular- hairy, obconical.

Dangs, Rajpipla, north Gujarat (Balaram) and Kutch, in moist places along river banks; rare; native of America.

FLS & FRS: Oct.-Jan.

AGERATUM L.

Ageratum conyzoides L. Sp. Pl. 839. 1753; FBI 3:243; C 2:70; WI 1:40; Ch & O 123; S & J 27.

Annual, 10-40 cm tall, glandular-pubescent herbs. Leaves 1.5-9.5×0.6-5 cm, broadly ovate, appressed-hairy. Heads 0.3-0.6 cm across, pedunculate, white or seldom pale-violet, in terminal, paniculate cymes. Achenes 0.4-0.5 cm long, cuneate, black, sharply trigonous, glabrous or hairy on angles only.

Throughout, in moist ground, scattered or gregarious; common and abundant; native of Mexico. (MANKAD MARI, AJGANDHA, DHOLI SADDI).

FLS & FRS : Nearly throughout the year.

AMBERBOA Less. nom. cons.

Amberboa ramosa (Roxb.) Jeffrey in Scientist 3:29. 1959; Ch & O 127. *Carduus ramosum* Roxb. Fl. Ind. 3:407. 1832. *Volutarella divaricata* Bth. & Hk. f. ex Hk. f. FBI 3:383. 1881;

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C 2:115. *Oligochaeta ramosa* (Roxb.) **Wagen.** in Verff. Geobot. Inst. Rubel. 37:323. 1962; S & J 28.

15–50 cm tall, diffuse or suberect, nearly glabrous herbs. Leaves 0.7–9.5×0.2–3 cm, obovate-oblong, almost sessile, scabrid beneath, margins spinous toothed. Heads pale- to bright-purple, 1.5–2.2×0.5–1.5 cm, ovoid-oblong, solitary, terminal. Achenes 0.4–0.5 cm long, obconical or cuneate, angular, pale-brown or nearly black, punctate between prominent ribs.

Throughout, a weed in waste places, and cultivated fields; common. (BHONYADANDI, BADAVARD).

FLS & FRS : Throughout the year.

ANAPHALIS DC.

Anaphalis cutchica Cl. Comp. Ind. 111.1876; FBI 3:284; S & J 27.

20–35 cm tall, unbranched, white-tomentose herbs. Leaves 2.5–6×0.3–0.6 cm, alternate, sessile or subsessile, narrowly linear or linear-obovate, tomentose. Heads 0.3–0.5 cm long, many, in terminal fascicles, creamy-white.

Kutch and Saurashtra (Barda Mountains); not very common.

FLS & FRS : Aug.–Sep.

ARTEMISIA L.

Key to species

1. Lower leaves petiolate, 1–3-pinnatisect .. .. *A. scoparia*
1. Lower leaves simple, sessile .. .. *A. parviflora*

Artemisia parviflora Buch.-Ham. ex Roxb. Hort. Beng. 61.1814 (nomen) & Fl. Ind. 3:420. 1832; FBI 3:322; C 2:104; S & J 27.

45–75 cm tall herbs, woody at base. Leaves 2.5–6×0.5–1.5 cm, sessile, obovate or obovate-lanceolate, glabrous or sparsely hairy Heads 0.15–0.2 cm broad, pale-white, in 20–25 cm long, terminal panicles. Achenes minute, ellipsoidal, glabrous, smooth, brown.

Saurashtra (Girnar, Junagadh).

FLS & FRS : Oct.–Dec.

Artemisia scoparia Waldst. & Kit. Descrip. & Icon. Pl. Rar. Hungary 1:66. t. 65 1802; FBI 3:323; C 2:104.

60–100 cm tall, perennial herbs. Leaves 1.5–2 cm long, opposite or whorled, pinnatisect, ultimate segments filiform. Heads greenish-white, subsessile, in 15–20 cm long, terminal, panicled racemes. Achenes minute, ellipsoidal, pale-brown.

North Gujarat (Himmatnagar river beds); scattered, common.

FLS & FRS : Dec.–Feb.

BIDENS L.

Key to species

1. Leaves 1–2-pinnately compound; segments ovate-lanceolate or linear, entire, lobed or toothed .. .. .. *B. bipinnata*
1. Leaves simple, entire or biternate, lobes broadly elliptic, ovate or linear, serrate .. .. *B. biternata*

Bidens bipinnata L. Sp. Pl. 832 1753; Ch & O in Ind. For. 87 : 251. 1961 & Fl. Pavagadh 126. 1966. *Bidens pilosa* L. var. *bipinnata* (L.) Hk. f. in Hk. f. FBI 3:309. 1881.

This species is similar to *B. biternata* (Lour.) Merr. & Sherff but differs in the leaf character. Pavagadh; common.

FLS & FRS : Sep.

Bidens biternata (Lour.) Merr. & Sherff in Bot. Gaz. 88:293. 1929; Ch & O 125; S & J 27; S 133. *Coreopsis biternata* Lour. Fl. Cochinch. 508. 1790. *Bidens pilosa* auct. non L.; FBI 3:309; C 2:101.

Annual, erect herbs, 40–60 cm tall. Leaves 4–15 cm long; lobes bipinnatisect, glabrous. Heads yellow or yellowish-brown, solitary, terminal, pedunculate. Achenes 1–1.2 cm long, light-black, spindle-shaped, 4-gonous, ribbed, glabrous or sparsely hairy, with two retrorsely scabrid, brown awns.

Throughout; common, gregarious. (KARAKOKDI, SAMARA KOKDI).

FLS & FRS : July–Dec.

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BLAINVILLEA DC.

Blainvillea acmella (L.) Philip. in Blumea 6:350. 1950; Ch & O 125; S & J 27. *Verbesina acmella* L. Sp. Pl. 901. 1753. *Eclipta latifolia* L. f. Suppl. 378. 1781. *Blainvillea rhomboidea* Cass. Nat. Dict. Sci. Nat. 29:494. 1823; C 2:97. *Blainvillea latifolia* (L. f.) DC. in Wt. Contrib. 17. 1834; FBI 3:305.

30–90 cm tall, appressed-hairy annuals. Leaves 1.5–11 × 0.5–6 cm, ovate, ovate-rhomboid or ovate-lanceolate, appressed-hairy. Heads 0.6–0.8 cm across, white or yellow, in axillary and terminal cymes. Achenes of two types, those of ray florets 0.2–0.35 cm long, triquetrous, obconical, disc floret ones 0.3–0.4 cm long, compressed, glabrescent.

Throughout; common. (DHOLU FULDU)

FLS & FRS : Aug.–Dec.

BLUMEA DC.

Key to species

1. Heads few, solitary, peduncled at ends of branches :
   2. Involucral bract tipped with a long, white bristle; pappus pink; leaves dentate, all alternate .. .. .. *B. obliqua*
   2. Involucral bract not tipped with a long bristle; pappus white; leaves serrate, uppermost opposite .. *B. bifoliata*
1. Heads few, in axillary and terminal corymbs at times clustered, rarely solitary :
   3. Plants densely woolly .. .. .. *B. malcolmii*
   3. Plants not as above :
      4. Prostrate or decumbent herbs .. .. *B. oxyodonta*
      4. Erect herbs :
         5. Heads pedunculate .. .. .. *B. eriantha*
         5. Heads sessile .. .. .. *B. belangeriana*
1. Heads many, arranged in spiciform cymes or panicles :
   6. Corolla purple .. .. *B. mollis*
   6. Corolla yellow :
      7. Glabrous or puberulous; leaf bases clasping stem; achenes setulose .. .. *B. bovei*

      7. Pubescent or villous; leaf base not clasping stem; achenes glabrous or with a few hairs :
         8. Receptacle pubescent; achenes ribbed .. *B. fistulosa*
         8. Receptacle glabrous; achenes not ribbed .. .. *B. lacera*

1. Heads many, small, in peduncled open corymbs :
   9. Upper leaves few, large, laciniate; receptacle pubescent .. .. *B. laciniata*
   9. Upper leaves many, small, toothed; receptacle glabrous .. .. *B. membranacea*

Blumea belangeriana DC. Prodr. 5:444. 1836; FBI 3:266; C 2:78.

30–50 cm tall, tomentose herbs. Leaves 1.5–15 × 1–5 cm, radical and cauline, subsessile, elliptic-oblong or obovate-oblong, membranous, tomentose. Heads 0.5–1 cm across, greenish-yellow, axillary, solitary and terminal, 2–3-fascicled. Achenes ± 0.1 cm long, glabrous or sparsely hairy, subangular, oblong or subglobose.

Bulsar, Dangs and Rajpipla, among grasses in cultivated fields and forest undergrowth; rare.

FLS & FRS : Dec.–Mar.

Blumea bifoliata (L.) DC. in Wt. Contrib. 14. 1834; FBI 3:261; C 2:75. *Conyza bifoliata* L. Sp. Pl. 1207. 1753.

Erect or diffuse, 20–60 cm tall, hairy herbs. Leaves 1–8 × 0.8–2 cm, tomentose. Heads 0.8–1.5 cm across, axillary, solitary, yellow. Achenes minute, narrowly oblong, 4–5-angled, angles hairy.

Vyara, Ubharat, Umbach, Vallabh Vidyanagar, Panchmahals, north Gujarat (Mahudha), scattered or subgregarious; common.

FLS & FRS : Oct.–Feb.

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Blumea bovei (DC.) Vatke in Linnaea 39:485. 1875; S & J 27. *Conyza bovei* DC. Ann. Sci. Nat. Bot. 261. 1839. *Blumea abyssinica* C. H. Schultz. in A. Rich. Tent. Fl. Abyss. 1:392. 1847.

15-40 cm tall herbs. Leaves 0.8-3.2×0.2-0.7 cm, linear to oblanceolate, glabrous, sessile. Heads 0.4-0.6 cm across. Pappus obscurely barbellate. Achenes minutely perforated.

Saurashtra (Sasangir, Jamnagar, Nawanagar, Dwarka) and Broach; rare.

FLS & FRS : Jan.-Apr.

Blumea eriantha DC. in Wt. Contrib. 15.1834; FBI 3:266; C 2:78; WI 1:197; Ch & O 129.

Strongly aromatic herbs, viscidly pubescent, atleast in younger parts. Leaves radical and cauline, 5-30×3-9 cm, elliptic-oblong, obovate-oblong or lyrately pinnatifid, sessile or petiolate, silky-pubescent, irregularly toothed, teeth spinous-tipped. Heads 0.3-1 cm across, yellow, in axillary and terminal, paniculate cymes. Achenes minute, angled, sparsely hairy on angles.

Throughout (except Saurashtra and Kutch); scattered or subgregarious; common. (KAPURIO, KALHAR)

FLS & FRS : Oct.-Mar.

Blumea fistulosa (Roxb.) Kurz in Journ. As. Soc. Bengal 46(2):187. 1877; S & J 27. *Conyza fistulosa* Roxb. Fl. Ind. 3:429. 1832. *Blumea glomerata* DC. in Wt. Contrib. 15. 1834; FBI 3:262; C 2:76.

30-90 cm tall herbs, woody at base. Leaves radical and cauline, radical ones lyrately pinnatifid or obovate, cauline ones 2.5-6×1-3.7 cm, sessile, oblong or elliptic-oblong, hairy. Heads 0.4-0.8 cm across, sessile, in interrupted, spiciform fascicles. Achenes 8-10-ribbed, glabrous or sparsely hairy, minute, 4-5-angled, oblong.

Saurashtra, north Gujarat (Khedbrahma) and Pavagadh, not common.

FLS & FRS : Dec.-Jan.

Blumea lacera (Burm. f.) DC. in Wt. Contrib. 14. 1834; FBI 3:263; C 2:76; WI 1:198; S & J 27. *Conyza lacera* Burm. f. Fl. Ind. 180. t. 59. f. 1. 1768.

Strongly aromatic, erect, 25-50 cm tall, densely glandular-villous annuals. Leaves 1.4-6.2×0.6-3.7 cm, elliptic-ovate or obovate, villous, sessile or subsessile. Heads 0.4-1.2 cm across, yellow, in axillary and terminal, spiciform panicles. Achenes minute, glabrate, subtetragonous.

Bulsar to Kutch in plains, a weed in waste places and cultivated fields; occasional. (KAPURIO)

FLS & FRS : Dec.-Jan

Blumea laciniata (Roxb.) DC. Prodr. 5:436. 1836; FBI 3:264. *Conyza laciniata* Roxb. Fl. Ind. 3:427. 1832.

20-30 cm tall, erect, viscidly hairy, annual herbs. Leaves 5.5-8×3-4 cm, sessile, pinnatifid, appressed-hairy. Heads 0.6-0.8 cm across, in 1.5-5.5 cm long, terminal and axillary panicles. Achenes glabrous, 8-10-ribbed.

In moist river beds at Baroda and Broach.

FLS & FRS : Mar.-Apr.

Blumea malcolmii (Cl.) Hk. f. in Hk f. FBI 3:266. 1881; C 2:78; WI 1:198; Ch & 129; S 129. *Pluchea malcolmii* Cl. Comp. Ind. 95. 1876.

Decumbent or ascending, 30-45 cm tall herbs. Leaves 2-12.5×1-5.5 cm, sessile, obovate-oblong or elliptic-oblong. Heads 1-1.2 cm across, in terminal, leafy panicles. Achenes obscurely angled, shining, sparsely hairy.

Dangs and Pavagadh; rare.

FLS & FRS : Nov.-Mar.

Scanned by CamScanner

Blumea membranacea DC. Prodr. 5:440. 1836; FBI 3:265; C 2:77; Ch & O 130; S & J 27.

25-100 cm tall herbs, patently glandular-hairy in younger parts. Leaves 1.5-13.5×1-5.8 cm, lyrately pinnatifid in basal parts, gradually becoming entire, ovate-lanceolate or elliptic-lanceolate, glabrous or sparsely hairy. Heads yellow, 0.4-0.6 cm across, in terminal, 10-45 cm long panicles. Achenes minute, spindle-shaped, ribbed, brown, angled, glabrous or sparsely hairy on angles.

Throughout (except Kutch) in shaded spots and forest undergrowth.

FLS & FRS : Nov.-Mar.

Blumea mollis (D. Don) Merr. in Phil. Journ. Sci. Bot. 5:395. 1910; S & J 27; S 127. *Erigeron molle* D. Don, Prodr. 172. 1825. *Blumea wightiana* DC. in Wt. Contrib. 14. 1834; FBI 3:261; C 2:75.

20-60 cm tall, glandular-pubescent, erect annuals. Leaves 1.5-13×0.8-6.7 cm, obovate-oblong or elliptic-oblong, membranous, thinly villous, Heads 0.4-0.7 cm across, pale-to bright -purple, in axillary and terminal panicles. Achenes 4-5-angled, brown, glabrescent.

Throughout (except Kutch), everywhere; common. (BHUTACO, CHANCHADMARI).

FLS & FRS : Nov.-Feb.

Blumea obliqua (L.) Druce in Rep. Bot. Exch. Cl Brit. Isles 4:609. 1917; S & J 27. *Erigeron obliquum* L. Mant. 2:573. 1771. *Blumea amplectans* DC. in Wt. Contrib. 13. 1834; FBI 3:261; C 2:75.

Erect, suberect or diffuse, glabrescent herbs. Leaves 1.5-7.5×0.6-2 cm, elliptic-oblong or obovate-oblong. Heads 0.6-1 cm long, solitary, axillary and in terminal cymes. Achenes minute, oblong-cuneate, appressed-hairy.

Bulsar to Kutch; not common.

FLS & FRS : Oct.-May

Blumea oxyodonta DC. in Wt. Contrib. 15.1834; FBI 3:266; C 2:77; S 128.

Annual, prostrate or procumbent herbs. Leaves 0.6-8×0.2-4.7 cm, elliptic-oblong or obovate-oblong, sometimes orbicular, densely woolly-pubescent. Heads yellow, few, in terminal and axillary, lax cymes. Achenes 4-5-angled, sparsely hairy, pale-brown.

Dharampur, Dangs, Vyara, Rajpipla, Pavagadh, Chhotaudepur, Panchmahals and north Gujarat (Mahudi), among grasses and cultivated fields; occasional.

FLS & FRS : Oct.-June

CAESULIA Roxb.

Caesulia axillaris Roxb. Pl. Cor. 1:64. t. 93. 1795; FBI 3:291; C 2:92; Ch & O 123.

Diffuse, glabrous herbs. Leaves 2-13×0.5-2 cm, sessile, lanceolate. Heads 0.8-1.7 cm across, greyish-white or ash-coloured, axillary, solitary, sessile. Achenes 0.2-0.5 cm across (including wings), blackish-brown, obovoid, notched at apex, sparsely toothed on either side of notch, faintly ribbed.

Throughout in damp places and drying moist ground, at times gregarious.

FLS & FRS : Aug.-May

CENTIPEDA Lour.

Centipeda minima (L.) A. Br. & Aschers. Ind. Sem. Hort. Berol. App. 6. 1867. *Artemisia minima* L. Sp. Pl. 849. 1753. *Centipeda orbicularis* Lour. Fl. Cochinch. 2:493. 1790; FBI 3:317; C 2:103.

Prostrate herbs. Leaves 0.5-1.5×0.2-0.4 cm, oblanceolate or oblong-lanceolate, nearly glabrous. Heads yellow, 0.2-0.4 cm across, solitary, axillary, sessile or subsessile. Achenes minute, oblong, 4-angled, angles hairy.

Scanned by CamScanner

In Narmada river bed at Broach and Chhotaudepur forest division.

FLS & FRS : Aug.–Apr.

CENTRATHERUM Cass.

Centratherum phyllolaenum (DC.) Bth. ex Cl. Comp. Ind. 1876; FBI 3.228; C 2:62; Ch & O 127; S 122. *Decaneurum phyllolaenum* DC. Prodr. 7:264. 1838.

Erect, suffrutescent, nearly glabrous herbs. Leaves 3.3–20 × 1.8–8.5 cm, broadly elliptic, whitish-tomentose beneath. Heads 1.3–2.6 cm across, terminal, solitary, sessile, bright-purple or mauve-coloured. Achenes glabrous, oblong. brown, prominently 10-ribbed.

Dangs, Chhotaudepur, Pavagadh and Panchmahals; rare.

FLS & FRS : Aug.–Oct.

CHRYSANTHELLUM A. Rich.

Chrysanthellum indicum DC. Prodr. 5:631. 1836; FBI 3:310; Bedi, Journ. Bombay nat. Hist. Soc. 70:591. 1973.

10–40 cm tall, erect, annual, glabrous herbs. Leaves alternate, 2–8 cm long, bipinnatifid, segments secondarily lobed, ultimate segments broadly linear or cuneate. Heads 0.3–0.5 cm across (in fruits 0.5–0.7 cm across), pedunculate, yellow, with golden-yellow, spreading, involucral bracts. Achenes ± 0.3 cm long, oblong, linear-oblong, subcompressed, outer ones tubercled dorsally, 3-grooved on each face, inner not tubercled, ridged on each face.

Reported by Bedi from road sides near Baria Palace, Devgadhbaria, Panchmahals district.

FLS & FRS : July–Aug.

CICHORIUM L.

Cichorium intybus L. Sp. Pl. 813. 1753; FBI 3:391; C 2:127; Bailey 983; WI 2:161; Ch & O 126.

Erect, appressed-hairy herbs, 1–1.5 m tall. Leaves 2–7.2 × 0.7–2.3 cm, ovate-elliptic to ovate-lanceolate. Heads 0.8–1.2 cm across, bright-purple or bluish-purple. Achenes obovoid-conical, glabrous.

Chhotaudepur, Pavagadh and Vallabh Vidyanagar, a weed in waste places; also cultivated. (CHIKORY).

FLS & FRS : Oct.–Mar.

COREOPSIS L.

Coreopsis tinctoria Nutt. in Journ. Acad. Philaldelphia 2:114. 1821; C 2:125; Bailey 1003.

45–100 cm tall, slender, glabrescent herbs. Leaves 4–16 cm long, bipinnatisect, segments linear-lanceolate, serrate. Heads 2–4 cm broad, solitary, terminal. Achenes 0.7–1 cm long, linear-oblong, beaked, slightly curved, dark-brown or nearly black.

Ornamental; seldom a weed in waste places.

FLS & FRS : Sep.–Oct.

CONYZA Less.

Key to species

1. Heads 0.7–0.8 cm across, arranged in sparingly branched corymbs .. .. *C. japonica*
1. Heads 0.2–0.6 cm across, in terminal, corymbose panicles .. .. *C. stricta*

Conyza japonica Less. Syn. Comp. 204. 1882; FBI 3:258.

This species is listed by Thaker et al. (1970) from Chhotaudepur.

FLS & FRS : Feb.

Conyza stricta Willd. Sp. Pl. 3:1922. 1804; FBI 3:258; C 2:73.

Erect, herbs, 30–60 cm tall. Leaves 0.3–6 × 0.1–0.6 cm, narrowly linear, lanceolate to oblanceolate, pubescent, sessile. Heads 0.2–0.3 cm arcoss, sulphur-yellow, in terminal corymbs. Achenes ± 0.1 cm long, compressed, minutely hairy.

Scanned by CamScanner

Dangs (Saputara) and Chhotaudepur (Ambadungar); common in Dangs.

FLS & FRS : Sep.–Dec.

CYATHOCLINE Cass.

Cyathocline purpurea (D. Don) O. Ktze. Rev. Gen. Pl. 338. 1891; Ch & O 130; S & J 27; S 124. *Tenacetum purpureum* D. Don, Prodr. Fl. Nep. 181. 1825. *Cythocline lyrata* Cass. in Ann. Sci. Nat. (Ser 1) 17:420. 1829; FBI 3:246; C 2:71.

Slender, erect or suberect, hairy herbs. Leaves radical and cauline, 2–9 cm long, pinnatifid, lobes 0.5–2.5×0.2–1.5 cm, hairy beneath. Heads 0.4–0.6 cm across, pale-to bright purple, in terminal, corymbose panicles. Achenes minute, oblong, pale-brown, faintly ribbed, glabrous.

Throughout (except Kutch) in moist ground. (OKHARAD)

FLS & FRS : Sep.–Mar.

DICOMA Cass.

Dicoma tomentosa Cass. in Bull. Soc. Philom. 47 t. 556. 1818; FBI 3:387; C 2:116; WI 3:57; S & J 27.

Erect, 10–40 cm tall, grey-tomentose herbs. Leaves 2.5–6.3× 0.3–1 cm, linear, sessile or subsessile. Heads pale-yellow, 0.8–1.2 cm across, solitary, axillary, leaf-opposed or terminal. Achenes cuneate, pale-brown, ribbed, angled, tomentose.

In scrub forests, frequent. (PARDESHI KANDHERI)

FLS & FRS : Oct.–Jan.

ECHINOPS L.

Echinops echinatus Roxb. Fl. Ind. 3:447. 1832; FBI 3:358; C 2:112; WI 3:127. f. 75; Ch & O 123; S & J 27.

30–60 cm tall, stout, rigid, cottony-white-pubescent, armed, suffrutescent herbs. Leaves 1.5–12×1–2.8 cm, sessile, pinnatifid, white-cobwebby-woolly beneath. Heads 3.4–5.5 cm across white

or pale-blue, solitary, terminal, spinescent. Achenes 0.4–0.7 cm long, obconical, subterete, villous.

Throughout in plains, scattered or subgregarious; common. (SHULIO, UTKANTO)

FLS & FRS : Oct.–Jan.

ECLIPTA L. nom. cons.

Eclipta prostrata (L.) L. Mant. 2:286. 1771; Ch & O 124; S & J 27; S 133. *Verbesina prostrata* L. Sp. Pl. 902. 1753. *Verbesina alba* L. Sp. Pl. 1902. 1753. *Eclipta erecta* L. Mant. 2:286. 1771; C 2:95. *Eclipta alba* (L.) Hassk. Pl. Jav. Rar. 528. 1848; FBI 3:304; WI 3:127. f. 76.

Strigosely hairy, erect, or diffuse herbs. Leaves 1–7.5× 0.5–3 cm, elliptic, elliptic-lanceolate, lanceolate-oblong, strigosely hairy. Heads white, 0.5–1.3 cm across, axillary, terminal, solitary or 2–3-fascicled. Achenes ± 0.2 cm long, obconical, compressed, narrowly winged, ridged on one side, deep-brown to almost black, glabrous.

Throughout in damp places; common. (BHANGRO)

FLS & FRS : Throughout the year.

ELEPHANTOPUS L.

Elephantopus scaber L. Sp. Pl. 814. 1753; FBI 3:242; C 2:68; WI 3:149; S & J 27; S 123.

Erect, softly pubescent, 30–45 cm tall herbs. Leaves mostly radical, 4.5–18×1.6–6.5 cm, obovate-oblong, serrate, appressed-hairy, cauline ones few, sessile. Florets blue to bluish-purple, in compound heads arranged in terminal, dichotomous cymes. Achenes 0.3–0.7 cm long, deltoid-conical, pale-brown, ribbed, pubescent.

Bulsar, Dangs and Saurashtra, in shaded spots and in forest undergrowth; frequent. (HASTIPAD, KHARSAT, BHONYA PATRI)

FLS : Sep.–Dec. *FRS* : Sep.–Mar.

Scanned by CamScanner

EMILIA Cass.

Emilia sonchifolia (L.) DC. in Wt. Contrib. 24. 1834; FBI 3:336; C 2:107; WI 3:172; Ch & O 128; S & J 28. *Cacalia sonchifolia* L. Sp. Pl. 835. 1753.

An erect or diffuse, glabrous herb, 15–70 cm tall. Leaves 4–15×0.5–3 cm, sessile, glabrous, pinnatifid, ovate to ovate-lanceolate or obovate-spathulate. Heads 0.4–0.6 cm across, bright-purple, in terminal, lax panicles. Achenes brown, narrowly oblong, ribbed, hairy.

Throughout; common. (HIRAN KHURI)

FLS & FRS : Aug.–Feb.

ERIGERON L.

Key to species

1. Achenes cylindric-oblong, pubescent .. .. *E. bonariensis*
1. Achenes obovate or ellipsoid, nearly glabrous .. *E. asteroides*

Erigeron asteroides Roxb. Fl. Ind. 3:432. 1832; FBI 3:254; C 2:73; WI 3:186; S & J 28.

30–45 cm tall, patently hairy herbs. Leaves 2–4×0.6–1.2 cm, obovate-oblong, sessile or shortly petiolate, entire or pinnatifid. Heads 0.8–1.5 cm across, pedunculate, terminal, ray florets white or pale-blue, disc florets yellow. Achenes minute, yellowish, obovate or ellipsoidal, nearly glabrous, flat.

Saurashtra (MAREDI)

FLS & FRS : Aug.–May

Erigeron bonariensis L. Sp. Pl. 863. 1753; Burtt in Kew Bull. 1948: 371. 1948; Maheshwari, Fl. Delhi 192 1963.

Stout, 30–60 cm tall herbs. Leaves 1.5–4.5×0.1–0.3 cm, narrowly linear, linear-spathulate or linear-obovate, appressed-hairy, sessile. Heads 0.6–1 cm across, in 6–10 cm long, terminal, corymbose cymes, ray florets white, disc florets yellow. Achenes minute, pale-brown.

North Gujarat (Prantij), in moist ground along margins of a pond; rare.

FLS & FRS : Jan.–Feb.

EUPATORIUM L

Eupatorium odoratum L. forma **squarrosum** Koster. f. in Blumea 7(1):290. 1952. *Eupatorium odoratum* L. Syst. (ed. 10) 1250. 1759; FBI 3:244; WI 3:223. *Eupatorium repandum* Sensu S & J 28.

30–50 cm tall herbs. Leaves 2.5–7×0.4–1 cm, ovate-lanceolate, glabrescent, minutely glandular-punctate. Heads 0.6–1 cm long, bluish, in terminal, lax, corymbose panicles. Achenes 0.2–0.3 cm long, deltoid-conical, glabrous or hairy on angles, black.

Native of America; cultivated, also an escape.

FLS & FRS : Throughout the year.

FLAVERIA Juss.

Flaveria australasica Hk. in Mitch. Journ. Trop. Austral. 118. 1838. *Flaveria repanda* Lagasc.; Thaker, Fl. Kutch 133.1926. *Flaveria contrayerba* Pers. Syn. 2:489. 1807; C 2:125. *Flaveria trinervia* Baill.; S & J 28.

Erect, 20–60 cm tall herbs. Leaves 1.2–5×0.5–1.2 cm, obovate, glabrous. Heads 0.8–1 cm across, yellow, axillary, sessile solitary. Achenes obovate-oblong, black, prominently ribbed.

Kutch, Saurashtra and Surat; not common; native of America, (PILO BHANGRO, PARDESHI BHANGRO)

FLS & FRS : Jan.

GLOSSOCARDIA Cass.

Glossocardia bosvallea (L. f.) DC. in Wt. Contrib. 19. 1834; WI 4:141. f. 66; S & J 28. *Verbesina bosvallea* L. f. Suppl. 379. 1781. *Glossocardia linearifolia* Cass. in Dict. Sci. Nat. 19:62. 1821; FBI 3:308; C 2:100.

Scanned by CamScanner

Diffuse or suberect, 5–20 cm tall herbs. Leaves 1–2.5 cm long, bipinnatisect, apiculate. Heads 0.6–1 cm long, yellowish-brown, solitary, terminal. Achenes 0.5–0.6 cm long, compressed, oblong, thickened and densely ciliate on margins.

Throughout among grasses; not common. (AMBAU SUVA)

FLS & FRS : Aug.–Jan

GLOSSOGYNE Cass.

Glossogyne bidens (Retz.) Alst. in Trim. Handb. Fl. Ceylon 6(Suppl.): 163. 1932; WI 3:141; S & J 28. *Zinnia bidens* Retz. Obs. 5:23. 1789. *Glossogyne pinnatifida* DC. in Wt. Contrib. 19. 1834; FBI 3:310; C 2:102.

This species is listed by Thaker J. I. (1910, p.417) from Barda hills, Saurashtra. It is included by Santapau & Janardhanan (1967) in their check-list on this authority. (KAGSI VA).

GNAPHALIUM L.

Key to species

1. Heads in leafy clusters, axillary or terminal .. *G. pulvinatum*
1. Heads in leafy spikes .. .. *G. indicum*
1. Heads in leafless, terminal, corymbose panicles .. .. *G. luteo-album*

Gnaphalium indicum L. Sp. Pl. 852. 1753; FBI 3:289; C 2:87; WI 4:157; Ch & O 133; S & J 28; S 131.

Polymorphic, erect, suberect, diffuse or radially spreading herbs. Leaves 0.5–7×0.2–0.6 cm, sessile or subsessile, greyish-white-tomentose, linear-lanceolate or linear-spathulate. Heads creamy-yellow to bright-yellow, in clusters, forming 1–3.5 cm long, terminal spikes. Achenes minute, oblong, brown, thinly hairy.

Throughout in moist ground; common. (PHULVO)

FLS & FRS : Oct.–Apr.

Gnaphalium luteo-album L. Sp. Pl. 851. 1753; FBI 3:288; C 2:86; WI 4:157; S & J 28; S 131.

Erect, 30–40 cm tall herbs. Leaves 2–9×0.3–0.8 cm, narrowly linear-oblong or oblong-spathulate, greyish-white-tomentose beneath. Heads bright-golden-yellow, in 0.8–1.5 cm broad clusters. Achenes minute, oblong, pale-brown, minutely papillose, glabrescent.

In moist places at Dangs, Rajpipla, Broach, north Gujarat (Ahmedabad, Mahudi) and Saurashtra; occasional. (MUNDERI)

FLS & FRS : Dec.–Apr

Gnaphalium pulvinatum Del. Descrip. de l'Egypte 266. t. 44. 1812; FBI 3:289; C 2:87; Ch & O 134.

Prostrate, woolly, radially spreading herbs. Leaves 0.5–1 ×0.2–0.4 cm, spathulate or obovate, sessile. Heads 0.25–0.4 cm across, pale-to dark-brown, terminal and axillary, in leafy clusters. Achenes minute, oblong, minutely papillose.

In moist places, in small patches at Broach, Panchmahals, Mahi ravines, north Gujarat (Ahmedabad, Dhansura, Idar, Mahudi); rather not frequent.

FLS & FRS : Dec.–Mar.

GONIOCAULON Cass. nom. cons.

Goniocaulon indicum (Klein ex Willd.) Cl. Comp. Ind. 236. 1876. *Serratula indica* Klein ex Willd. Sp. Pl. 3:1642. 1803. *Goniocaulon glabrum* Cass. in Bull. Soc. Philom. 34.1817 & Dict. Sci. Nat. 19:201. 1821; FBI 3:377; C 2:113; S & J 28.

40–70 cm tall, slender herbs. Leaves 1–7×0.2–0.8 cm, linear-lanceolate, linear-oblong or obovate-oblong, sessile, glabrous. Heads 1–1.5 cm long, pale-to bright-purple, in axillary clusters and terminal, corymbose panicles. Achenes 0.2–0.4 cm long, brown, oblong, glabrous, prominently ribbed.

Dangs, Vyara, Rajpipla, Broach, Chhotaudepur, north Gujarat (Khedbrahma) and Saurashtra; not frequent.

FLS & FRS : Dec.–Jan.

Scanned by CamScanner

GRANGEA Adans.

Grangea maderaspatana (L.) Poir. Encycl. Meth. Suppl. 2:825. 1811; FBI 3:247; C 2:72; WI 4:252. f. 154; Ch & O 131; S & J 28; S 126. *Artemisia maderaspatana* L. Sp. Pl. 849. 1753.

Prostrate or procumbent, glandular-pubescent herbs. Leaves 1.5-8×0.5-1.5 cm, oblanceolate, pinnatifid. Heads 0.5-1.2 cm across, yellow, solitary, terminal or leaf-opposed, sessile or subsessile. Achenes ± 0.2 cm long, glandular-pubescent.

Throughout, in small patches, in moist ground. (ZINKI MUNDI)

FLS & FRS : Oct.-Mar., rarely upto July.

GUIZOTIA Cass. nom. cons.

Guizotia abyssinica Cass. in Dic. Sci. Nat. 59:248. 1829; FBI 3:308; C 2:125; WI 4:270. f. 136.

60-120 cm tall, suffruticose herbs. Leaves 4-15×1-4 cm, glabrous, membranous, lanceolate, sessile. Heads yellow, 1.5-3 cm across, solitary, axillary and terminal. Achenes 0.4-0.6 cm long, black, glabrous, longitudinally ribbed.

Dharampur, Bulsar, Dang and Rajpipla; not common; cultivated; also an escape. (KURSAN, RAMTIL, KALATIL)

FLS & FRS : Sep.-Jan.

HYMENATHERUM Cass.

Hymenatherum tenuifolium Cass. Dict. Sci. Nat. 22:314. 1821-22; DC. Prodr. 5:642. 1834; Maheshwari, Fl. Delhi 202.1963.

Strongly aromatic, 15-20 cm tall, erect, annual herbs. Leaves deeply pinnatisect, segments more or less filiform. Heads yellowish-brown, rayed, 1.5-2 cm across, terminal. Achenes oblong, angled, black, hispidly hairy.

This species was found as a garden weed in Baroda in 1955; native of Central America.

FLS & FRS : Oct.-Dec.

LACTUCA L.

Key to species

1. 60-150 cm tall, stout herbs; leaves radical and cauline, radical ones 12-40 cm long.. .. .. .. *L. runcinata*
1. 20-40 cm tall, slender herbs; leaves mostly cauline, not more than 10 cm long .. .. *L. remotiflora*

Lactuca remotiflora DC. in Wt. Contrib. 26. 1834; FBI 3:403; C 2:118; WI 6:15.

This species is listed by Thaker J. I. from Saurashtra (1910) and (Kutch 1926). (PATHARI, PATHARDI).

FLS & FRS : Monsoon

Lactuca runcinata DC. in Wt. Contrib. 26. 1834; C 2:118; S & J 28. *Lactuca heyneana* DC. Prodr. 7:140. 1838; FBI 3:403; WI 6:15.

It is listed by Thaker J. I. from Saurashtra (1910) and Kutch (1926). Santapau & Janardhanan (1967) list it as doubtful in Saurashtra. (SONKI)

FLS & FRS : Monsoon

LAGASCEA Cav.

Lagascea mollis Cav. in Ann. Sci. Nat. 6:332. 1803; FBI 3:302; C 2:93; S & J 28.

30-75 cm tall, slender herbs, with pale-brown bark. Leaves 3-8×1.4-4.3 cm, ovate, ovate-lanceolate, white or grey-tomentose beneath. Heads 1.5-2 cm across, pale-blue or white, axillary, solitary and in terminal fascicles. Achene ± 0.4 cm long, obconical, white-tomentose.

South Gujarat (Dangs, Bulsar, Broach, Varadia), central Gujarat (Chhotaudepur) and Saurashtra, in hedges; occasional; native of Central America

FLS & FRS : Aug.-Oct.

Scanned by CamScanner

LAGGERA Sch.-Bip. ex Oliver

Key to species

1. Stem winged.. .. ..*L. alata*
1. Stem not winged.. .. ..*L. aurita*

Laggera alata (D. Don) Sch.-Bip. ex Oliver in Trans. Linn. Soc. 29:94. 1873; FBI 3:271; C 2:80; WI 6:25; S & J 28; S 129. *Erigeron alatum* D. Don, Prodr. Fl. Nep. 171. 1825.

Stout, erect, glandular-pubescent, 30-60 cm tall herbs. Leaves 3-6×0.5-1.5 cm, sessile, oblong or oblong-lanceolate. Heads 0.8-1.2 cm across, purple, axillary, solitary and in short, terminal racemes. Achenes cylindric, faintly ribbed, appressed-hairy.

Kutch, Saurashtra and north Gujarat (Keshni), a road side weed; rather rare. (BODO KALHAR, BODO KALHAD)

FLS & FRS : Nov.-Feb.

Laggera aurita (L. f.) Sch.-Bip. in Schweinf Beitr. Fl. Aethiop. 151. 1867; FBI 3:271; C 2:80; WI 6:25; S & J 28; S 129. *Conyza aurita* L. f. Suppl. 367. 1781.

30-75 cm tall, glandular-pubescent herbs. Leaves 1-9×0.4-2.6 cm, obovate-oblong or elliptic-oblong, pinnatifid. Heads 0.5-1.2 cm across, rosy or pale-purple, in terminal and axillary, corymbose panicles. Achenes minute, pale-brown, faintly ribbed, sparsely hairy.

Throughout, a road side weed; common. (BHINT MULO).

FLS & FRS : Oct.-Mar.

LAUNAEA Cass.

Key to species

1. Achenes not winged :
   2. Heads in panicles.. .. ..*L. resedifolia*
   2. Heads in fascicles or in racemes :

   3. Stem not rooting at nodes; heads 1.5-2 cm across; leaves radical and cauline, radical ones 4-25×1-4.5 cm... .. .. *L. procumbens*
   3. Stem rooting at nodes; heads upto 1.5 cm across; leaves only radical, 2.5-8×0.7-1.7 cm....*L. sarmentosa*
1. Achenes winged .. ..*L. glomerata*

Launaea glomerata (Jaub. & Spach.) Hk. f. in Hk. f. FBI 3:417. 1881; C 2:123; WI 6:42; S & J 28. *Microrhynchus glomeratus* Jaub. & Spach. Ill. Pl. Orient. 3:105. t. 275. 1849.

Glaucous, glabrous, diffuse or suberect herbs. Leaves radical. 7-15×2.5-4 cm, sessile, pinnatifid. Heads yellow 1.2-1.8 cm long, bell-shaped, clustered at ends of branches. Achenes 0.4-0.5 cm long, oblong, truncate at both ends.

Saurashtra.

FLS & FRS : Oct.

Launaea procumbens (Roxb.) Ramayya & Rajagopal in Kew Bull. 23: 465. 1969. *Prenanthes procumbens* Roxb. Fl. Ind. 3:404. 1832. *Chondrilla nudicaulis* L. Mant. 273. 1767. *Microrhynchus fallax* Jaub. & Spach. Pl. Orient. t. 276. 1849. *Launaea nudicaulis* (L.) Hk. f. in Hk. f. FBI 3:416. 1882; C 2:122; WI 6:42. f. 21; Ch & O 131 (non Less. 1832). *Launaea fallax* (Jaub. & Spach.) O. Ktze. Rev. Gen. Pl. 3:51. 1891; S & J 28.

Prostrate or suberect, perennial herbs. Leaves sessile, glabrous, radical ones in rosette, lyrate or runcinate, cauline ones few, linear-lanceolate, pinnatifid. Heads creamy-yellow, 1-1.5 cm across, fascicled or subracemose. Achenes minute, smooth, brown, inner ones 4-gonous, outer ones flat, slightly falcate.

Throughout, everywhere; common. (MOTI BHONPATRI)

FLS & FRS : Throughout the year.

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Launaea resedifolia (L.) Druce in Rep. Bot. Exch. Cl. Brit. Isles 1913: 420. 1914; S & J 28. *Scorzonera resedifolia* L. Sp. Pl. 1198. 1753. *Launaea chondrilloides* Hk. f. in Hk. f. FBI 3:415. 1881; C 2:121.

Perennial, erect, 30–70 cm tall, glabrous herbs. Leaves radical and cauline, radical ones 6.5–15 × 1–2 cm, lyrately-pinnatifid, cauline ones 5–7 × 0.8–1 cm, sessile, lobed. Heads yellow. Achenes oblong, truncate at both ends, prominently ribbed.

Saurashtra and north Gujarat (Mahudi); not common.

FLS & FRS : Nov.–Feb.

Launaea sarmentosa (Willd.) Alst. in Trim. Handb. Fl. Ceylon 6:71. 1931; S & J 28; WI 6:42. *Prenanthes sarmentosa* Willd. Sp. Pl. 3:1540. 1804. *Launaea pinnatifida* Cass. in Ann. Sci. Nat. (Ser. 1) 23:85. 1831; FBI 3:416; C 2:122.

Creeping, slender, radially spreading herbs. Leaves lyrate or runcinate, pinnatifid, sessile, glabrous. Heads bright-yellow, 0.8–1.2 cm across, solitary or 2–3-fascicled. Achenes 0.4–0.6 cm long, subtetragonous, truncate at apex.

On sands along sea coast and river beds; common. (BHONPATRI, NANI BHONPATRI)

FLS & FRS : Throughout the year.

PARTHENIUM L.

Parthenium hysterophorus L. Sp. Pl. 988. 1753; Rao in Journ. Bombay nat Hist. Soc. 54:218. 1956; WI 7:268; S 329.

30–60 cm tall, erect, stout undershrubs. Leaves 4–11.5 cm long, pinnatifid, appressed-hairy. Heads white, 0.3–0.4 cm across, in terminal, paniculate corey s. Achenes minute.

Dangs, Broach, Ra[illegible]la (Netrang) and Vallabh Vidyanagar; not common; native of West Indies.

FLS & FRS : Oct.–Mar.

PLUCHEA Cass.

Key to species

1. Heads in compound corymbs :
   2. Bracts of outer series of involucre oblong, obtuse; involucre slightly contracted near mouth .. ..*P. lanceolata*
   2. Bracts of outer series of involucre ovate, acute; involucre bell-shaped :
      3. Leaves distinctly serrato-crenate, obovate-oblong; achenes hairy .. ..*P. tomentosa*
      3. Leaves nearly entire, elliptic-oblong; achene glabrous .. ..*P. wallichiana*
1. Head subsolitary .. ..*P. arguta*

Pluchea arguta Boiss. Diag. (Ser. 2) 3:5.1856; FBI 3:273; C 2:82; Blatter in Journ. Bombay nat. Hist. Soc. 18:773. 1908.

Stout, much branched, shrubby, at times branches much spreading. Leaves 2.5–7 × 0.8–1.5 cm, sessile, obovate-oblong or oblanceolate, entire or inciso-pinnatifid, glandular-pubescent. Heads 0.8–1 cm across, long peduncled. Achenes appressed-hairy, cylindric, slightly ribbed.

Kutch and north Gujarat (Nalsarovar); common on saline soil.

FLS & FRS : Nov.–Feb.

Pluchea lanceolata (DC.) Cl. Comp. Ind. 94.1786; FBI 3:272; C 2:82; WI 8:161. f. 55; S & J 28. *Berthelotia lanceolata* DC Prodr. 5:376. 1836.

Erect undershrubs Leaves 3–6.5 × 0.6–1.2 cm, coriaceous, sessile, oblong or oblanceolate, thinly grey-hairy. Heads terminal, in much branched corymbs.

Saurashtra and Kutch; included on the authority of Thaker J. I. (1926, p. 148) and Santapau & Janardhanan (1967). (KHARI RASNA, RASNA).

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Pluchea tomentosa DC. in Wt. Contrib. 16.1834; FBI 3:272; C 2:81.

1–2 m tall undershrubs. Leaves 1.5–7×0.5–3 cm, pubescent, sessile. Heads in terminal, paniculate cymes. Achenes ± 0.1 cm long, obconical, brown, angular, appressed-hairy.

North Gujarat (Pahada, in Sabarmati ravines) and Kutch; rare.

FLS & FRS: Aug.–Sep.

Pluchea wallichiana DC. Prodr. 5:451. 1836; FBI 3:272; C 2:82.

1–1.5 m tall, viscidly-pubescent shrubs. Leaves 2–5×1.2–2.2 cm, sessile, pubescent. Heads 0.8–1.2 cm across, in viscidly-hairy, much branched, corymbose cymes. Achenes angular, pale-brown, glabrous.

Kutch and north Gujarat (Mahudi, in Sabarmati ravines); also listed by Cooke from Dangs; rare.

FLS & FRS: Jan.–Apr.

PULICARIA Gaertn.

Key to species

1. Ray florets tubular; inflorescence of paniculate cyme of few heads; leaves semiamplexicaul, but not cottony hairy; achenes hairy:
   2. Heads 1.2–1.5 cm broad .. .. .. *P. vulgaris*
   2. Heads 0.6–1 cm broad .. .. .. *P. foliolosa*
1. Ray florets ligulate; head solitary; leaves not amplexicaul at base; if amplexicaul, plants cottony-hairy; achenes glabrous or very sparsely hairy:
   3. Plants appressed cottony-white-tomentose; head 0.4–0.8 cm across, leaf margin toothed, crisped .. *P. crispa*
   3. Plants not cottony-hairy; heads 1–2 cm across; leaf margins not as above:

4. Peduncle somewhat thickened below the head .. .. *P. wightiana*
4. Peduncle uniformly thickened .. *P. angustifolia*

Pulicaria angustifolia DC. Prodr. 5:479. 1834; FBI 3:299; C 2:90; S & J 28.

Erect, 10–45 cm tall, glaucous herbs. Leaves 1–4×0.4–1.2 cm, sessile, pubescent, at length nearly glabrous, linear-oblong or obovate-spathulate. Heads 0.8–1.2 cm across, terminal. Achenes minute, pale-brown, oblong or subtetragonous, sparsely hairy.

Chhotaudepur, north Gujarat (Khedbrahma, Mahudi), Saurashtra and Kutch; rare. (SISOLIA NI JATNI VANASPATI)

FLS & FRS: Aug.–Nov.

Pulicaria crispa Sch.-Bip in Webb. & Benth. Phyt. Canar. 2:233. 1836–1847; FBI 3:299; WI 8:317.

Erect or suberect, 20–40 cm tall, woody herbs or undershrubs. Leaves 2–4.5×0.5–1.2 cm, sessile, narrowly linear-oblong or spathulate, cottony-white-tomentose beneath. Heads bright-yellow, terminal. Achenes minute, pale-brown, oblong, glabrous.

Savli (near Baroda), Vallabh Vidyanagar, north Gujarat (Mahudi, Pahada, Idar) and Kutch; rare, a weed in waste places, river beds and cultivated fields.

FLS & FRS: Aug.–Jan.

Pulicaria foliolosa DC. Prodr. 5:480. 1836; FBI 3:298; C 2:91; S & J 28.

Erect, annuals, 20–50 cm tall. Leaves 1–8×0.2–1.2 cm, oblong, linear-oblong or obovate-oblong, rarely narrowly spathulate, sessile, at length nearly glabrous, Heads bright-yellow. Achenes minute, oblong, pale-brown, ribbed, hairy.

Dangs, Rajpipla, Broach, north Gujarat and Saurashtra, in moist ground in river beds.

FLS & FRS: Dec.–May

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Pulicaria vulgaris Gaertn. Fruct. 2:461. t. 173. 1791; FBI 3:298; S & J 28.

This species is listed by Santapau & Janardhanan (1967) from Saurashtra.

Pulicaria wightiana (DC.) Cl Comp. Ind. 128. 1786; FBI 3:298; C 2:90; Ch & O 132; S & J 28. *Poloa wightiana* DC. Arch. Bot. (Paris) 2:514. 1833. *Callistephus wightianus* DC. Prodr. 5:275. 1836.

15–60 cm tall herbs. Leaves 1.5–4×0.3–1.2 cm, sessile, linear-oblong, pubescent. Heads bright-yellow, solitary, terminal. Achenes minute, pale-brown, oblong, glabrous.

Dangs, Pavagadh, north Gujarat (Mahudi, Mansa, Prantij. Himmatnagar, Idar), Saurashtra and Kutch; occasional, among grasses. (SONFULKI, SISORIA, SONASALIA)

FLS & FRS : Aug.–Jan.

SCLEROCARPUS Jacq.

Sclerocarpus africanus Jacq. Icon. Pl. Rar. 1:17. t. 176. 1782; FBI 3:305; C 2:96; Ch & O 132; S & J 28.

40–100 cm tall, slender, suffruticose herbs. Leaves 3.5–11 1.4–6 cm, ovate, ovate-oblong, appressed-hairy. Heads 0.5–1 cm across, yellow, solitary, terminal or leaf-opposed. Achenes 0.5–0.8 cm long, obovoid, subcompressed, smooth.

Throughout in hedges and forest undergrowth.

FLS & FRS : Aug.–Dec.

SENECIO L.

Key to species

1. Pappus paleaceous; leaves ovate-rhomboid;.. ..*S grahami*
1. Pappus hairy; leaves linear-oblong.. .. ..*S. dalzellii*

Senecio dalzellii Cl. Comp. Ind. 201. 1876; FBI 3:346; C 2:110; Ch & O 131; S 135.

Erect herbs. Leaves 3–8×0.3–1.2 cm, linear-oblong or linear-lanceolate. Heads yellow, 0.6–1.2 cm across, dichtomously corymbose. Achenes minute, scabrid-hairy.

Pavagadh.

FLS & FRS : Dec.–Jan.

Senecio grahami Hk. f. in Hk. f. FBI 3:347. 1881; C 2:110; S & J 28; S 136.

30–60 cm tall, stout, suffruticose herbs. Leaves 3–7×2–5 cm, prominently veined beneath. Heads 2–2.5 cm across, bright-yellow, in terminal, paniculate, corymbose cymes. Achenes 0.15–0.25 cm long, hairy.

Dangs (Malegaon-Saputara) and Pavagadh, among grasses; occasional; also in Saurashtra.

FLS & FRS : Aug.–Oct.

SIEGESBECKIA L.

Siegesbeckia orientalis L. Sp. Pl. 900. 1753; FBI 3:304; C 2:94; S & J 28; WI 9:326. f. 167.

45–60 cm tall herbs. Leaves 5–10×2–4 cm, ovate, ovate-lanceolate or deltoid-ovate, pubescent. Heads yellowish-brown, 0.8–1.2 cm broad, in leafy panicles. Achenes 0.2–0.3 cm long, obconical or obovoid, angled, black, slightly curved, glabrous, faintly longitudinally ribbed, minutely pitted.

Saurashtra and Kutch. (PILIBADAKADI)

FLS & FRS : Aug.–Oct.

SONCHUS L.

Key to species

1. Involucral bracts glandular-hairy; achenes horizontally rugose; cauline leaves auricled at base, auricles acute....*S. brachyotus*
1. Involucral bracts mostly glabrous; achenes not as above; auricles of cauline leaves obtuse :

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2. Leaves sharply toothed; auricles appressed to stem; achenes faintly ribbed, not tuberculate.. .. .. ..*S. asper*

2. Leaves minutely toothed; auricles spreading; achenes prominently ribbed and tuberculate.. ....*S. oleraceus*

Sonchus asper (L.) Hill. Herb. Brit. 1:47. t. 34. 1769; FBI 3:414; C 2:120; S 137; WI 9:430. *Sonchus oleraceus* L. var. *asper* L. Sp. Pl. 794. 1753.

35–60 cm tall, erect, hollow herbs. Leaves 3–6×0.8–1 cm, sessile, elliptic–oblong, pinnatifid. Heads 0.8–1.2 cm broad, yellow, in terminal, corymbose, umbellate cymes. Achenes 0.2–0.3 cm long, compressed, oblong, acuminate, dark–brown or straw-coloured, sparsely hairy.

Rajpipla, Panchmahals and north Gujarat (Kadi); rare.
FLS & FRS : Aug.–Dec., rarely upto May.

Sonchus brachyotus DC. Prodr. 7:186. 1838; Rau in Bull. bot. Surv. India 10 (Suppl. 2): 45. 1969. *Sonchus arvensis* auct. non. 1753; FBI 3:414; C 2:120; WI 9:430.

Perennial, 50-80 cm tall herbs, with hollow stem. Leaves 4.5–20×1.8–5 cm, oblanceolate, elliptic–oblong or lyrately pinnatifid, glabrous. Heads 1–1.5 cm broad, pale–yellow, in terminal, irregular, dense, umbellate cymes. Achenes 0.2–0.25 cm long, obconical, yellowish–brown.

Saurashtra and north Gujarat (Khedbrahma and Kadi); rare a weed in cultivated fields or waste places.
FLS & FRS : Nov.–Feb.

Sonchus oleraceus L. Sp. Pl. 794. 1753; FBI 3:414; C 2:119; S & J 28; S 137; WI 9:430.

70–100 cm tall, erect herbs, with milky juice. Leaves 6–14 ×2.5–5.3 cm, sessile, runcinate–pinnatifid, ovate or ovate–lanceolate, glabrous. Heads 1–1.5 cm across, yellow, in terminal, umbellate cymes. Achenes 0.2–0.25 cm long, narrowly ovoid, pale–brown.

Throughout, a road side weed, in forest undergrowth and in hedges; occasional, (DUDHALI SONKI).

FLS & FRS : Oct.–Feb.

SPHAERANTHUS L.

Sphaeranthus indicus L. Sp. Pl. 927. 1753; FBI 3:275; C 2:84; Ch & O 126; S & J 28; S 130.

Prostrate or procumbent, 30–45 cm tall, annual herbs, with winged stem. Leaves 1.2–10×0.7–3.5 cm, elliptic–oblong or obovate–oblong, glandular–pubescent. Heads 0.6–2×0.5–1.5 cm, globose or ovoid, solitary, terminal. Achenes ±0.1 cm long, oblong, obconical, somewhat angled, subcompressed, nearly glabrous.

Throughout in drying moist ground; common, often gregarious. (GORAKH MUNDI, BHURANDI)

FLS & FRS : Oct.–Apr.

SPILANTHES L.

Spilanthes calva DC. in Wt. Contrib. 19. 1834; Koster & Philip. in Blumea 6:354.1950. *Spilanthes acmella* auct. non Murr. 1774; FBI 3:307; C 2:99. *Spilanthes paniculata* Wall. ex DC. Prodr. 5:625. 1836; S & J 29.

20–45 cm tall, erect or ascending herbs. Leaves 2–6×0.7–2.5 cm, ovate, glabrous. Heads yellowish–brown, 0.6–1.2 cm across, ovoid. Achene 0.15–0.2 cm long, oblong, compressed, glabrous but for ciliate margins.

Bulsar, Dangs, Vyara, Rajpipla, Chhotaudepur and Saurashtra; common in forest undergrowth. (AKKALGARO, MARITI)

FLS & FRS : Sep.–Jan.

SYNEDRELLA Gaertn.

Synedrella nodiflora (L. ex Willd.) Gaertn. Fruct. 2:456. t. 171. f. 7. 1791; FBI 3:308. *Verbesina nodiflora* L. ex Willd. Sp. Pl. 3:2226. 1804.

30–60 cm tall herbs. Leaves 3–11×1.2–6 cm, ovate–lanceolate, hispidly hairy. Heads axillary or between forks of branches,

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pale-yellow. Achenes of ray florets 0.3–0.5 cm long, prominently ribbed, lacerate; those of disc florets 0.3–0.4 cm long, compressed, subtrigonous, minutely tuberculate.

Dangs (Mahal), along river banks; rare.

FLS & FRS : July–Jan.

TAGETES L.

Tagetes patula L. Sp. Pl. 887. 1753; C 2:125; Bailey 1013.

Erect herbs, 45–75 cm tall. Leaves 3–6 cm long, pinnately divided into linear-lanceolate segments. Head solitary, 1.5–2 cm across. Achenes linear, compressed or angular; pappus of 1–2 cm long, awned scales.

Cultivated; also an escape.

FLS & FRS : Throughout the year.

TRICHOLEPIS DC.

Key to species

1. Erect :
   2. Leaves semiamplexicaul; heads 2.5–4 cm across; pappus absent of a few hairs; achenes smooth .. *T. amplexicaulis*
   2. Leaves not as above; heads 1.5–2.5 cm across; pappus copius; achenes faintly ribbed .. .. *T. glaberrima*
1. Diffuse .. .. *T. radicans*

Tricholepis amplexicaulis Cl. Comp. Ind 240. 1876; FBI 3:381; C 2:115; S & J 29; S 136.

50–120 cm tall herbs. Leaves 5.5–14×1–4 cm, narrowly deltoid-ovate, linear-lanceolate, linear-oblong or obovate-oblong, glabrous. Heads terminal, solitary. Achenes 0.5–0.7 × 0.1–0.3 cm, obovate or oblong, smooth, glabrous, dark-brown.

Dangs (Saputara), scattered; not common; also in Saurashtra. (UBHO MULO)

FLS & FRS : Sep.–Oct.

Tricholepis glaberrima DC. Prodr. 6:754. 1837; FBI 3:381; C 2:114; Ch & O 127; S & J 29; S 136.

0.6–2 m tall, erect herbs. Leaves 2.1–13.5×0.5–4.5 cm, glabrous, sessile, lanceolate or linear-lanceolate, nigro-punctate. Heads bright-purple, solitary, terminal, ovoid. Achene 0.4–0.6 cm long, oblong, glabrous, brown.

Dangs, Pavagdh, Chhotaudepur, north Gujarat (Vireshwar) and Saurashtra; on the whole rare. (BRAHM DANDI, FISHIARU)

FLS & FRS : Sep.–Dec.

Tricholepis radicans (Roxb.) DC. Prodr. 6:564. 1837; FBI 3:381; C 2:114; S & J 29; S 136. *Carduus radicans* Roxb. Fl. Ind. 3:408. 1832.

This species much resembles *Amberboa ramosa* Jafri in habit and general appearance, but differs from it in having smooth achenes.

Saurashtra (Barda dungar). (BETHU FISHIARU)

FLS & FRS : Dec.–Jan.

TRIDAX L.

Tridax procumbens L. Sp. Pl. 900. 1753; FBI 3:311; C 2:102; Ch & O 130; S & J 29; S 134.

30–60 cm tall, glabrous or thinly hairy, erect or procumbent herbs. Leaves 2–6.5×0.3–4 cm, ovate-lanceolate, appressed hairy. Heads 0.8–1.2 cm across, solitary, terminal. Achenes 0.2–0.4 cm long, obovoid or cuneate, faintly ribbed, dark-brown.

Throughout, everywhere; common. (PARDESI BHANGRO)

FLS & FRS : Throughout the year.

VERNONIA Schreb. nom. cons.

Key to species

1. Heads 1–2.5 cm across .. .. .. *V. anthelmintica*
1. Heads 0.5–0.8 cm across :
   2. Achenes ribbed :

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3. Achenes glabrous, 10-ribbed .. .. *V. divergens*

3. Achenes hairy, 5-ribbed .. .. *V. cinarescens*

2. Achenes not ribbed .. .. *V. cinerea*

Vernonia anthelmintica (L.) Willd. Sp. Pl. 3:1634. 1800; FBI 3:236; C 2:66; S & J 29. *Conyza anthelmintica* L. Sp. Pl. (ed. 2) 1207. 1762.

Stout, glabrous or appressed-hairy, 0.5–1.5 m tall herbs. Leaves 3.5–15×1–9 cm, elliptic-lanceolate or lanceolate, pubescent. Heads bright-purple, in terminal corymbs. Achenes 0.4–0.5 cm long, obconical, blackish-brown, prominently 10-ribbed.

Bulsar, Dangs, Vyara, Rajpipla, Chhotaudepur, Cambay, Saurashtra; a road side weed; rare. (KALIJIRI)

FLS & FRS : Sep.–Dec.

Vernonia cinerascens Sch.-Bip. in Schweinf. Fl. Aethiop. 162. 1867; FBI 3:237; C 2:66; S & J 29.

Shrubs or undershrubs, 45–60 cm tall. Leaves 2–5.5×0.6–1.3 cm, oblong-spathulate, grey-pubescent. Heads bright-purple or pale-pink, in terminal panicles. Achenes minute, obconical.

Broach, Saurashtra, Kutch; not common. (VADI SADEDI)

FLS & FRS : Aug.–Dec.

Vernonia cinerea (L.) Less. in Linnaea 4:291. 1829; FBI 3:233; C 2:65; Ch & O 126; S & J 29; S 122. *Conyza cinerea* L. Sp. Pl. 862. 1753.

Erect, 30–100 cm tall herbs. Leaves 1.5–7×0.8–3.4 cm, ovate, elliptic or lanceolate, glabrescent above, densely hairy beneath. Heads pale-to bright-purple, in terminal, paniculate cymes. Achenes minute, brown, 4–5-angled, densely hairy on angles.

Throughout; common. (SAHADEVI, SADEDI)

FLS & FRS : Throughout the year.

Vernonia divergens (Roxb.) Edgew. in Journ. Asiat. Soc. Bengal 21:172. 1853; FBI 3:234; C 2:67; S 123. *Eupatorium divergens* Roxb. Fl. Ind. 3:414. 1832.

1.5–2.5 m tall shrubs. Leaves 4.5–12×1.5–6 cm, broadly elliptic, subcoriaceous, nigro-punctate beneath. Heads bright-purple, terminal and axillary. Achenes minute.

Dangs, not common.

FLS & FRS : Nov.–Mar.

VICOA Cass.

Key to species

1. Leaves sessile, auricled at base; ray florets with pappus.... .. .. *V. indica*

1. Leaves petiolate, not auricled at base; ray florets without pappus.. .. .. *V. cernua*

Vicoa cernua Dalz. in Dalz. & Gibs. Bombay Fl. 126 & 314. 1861; FBI 3:297; C 2:89; S 132.

20–40 cm tall, erect, slender herbs. Leaves 2.5–10×1–3.5 cm, elliptic or elliptic-lanceolate, appressed-hairy. Heads 0.7–1.5 cm across, yellow, axillary, solitary and in terminal corymbose panicles. Achenes minute, oblong, sparsely hairy.

Dangs (Malegaon-Saputara and Unai); occasional.

FLS & FRS : Oct.–Dec.

Vicoa indica (L.) DC. in Wt. Contrib. 10. 1834; Ch & O 133; S & J 29; S 132. *Inula indica* L. Sp. Pl. (ed. 2.) 1236. 1762; Willd. Sp. Pl. 3:2092. 1804. *Vicoa auriculata* Cass. in Ann. Sci. Nat. 17:418. 1829; FBI 3:297; C 2:88.

30–100 cm tall, lignose herbs or undershrubs. Leaves 2.8–9×0.5–0.8 cm, sessile, linear or linear-lanceolate, appressed-hairy, deflexed. Heads 0.7–1.2 cm across, bright-yellow, axillary, solitary, culminating in terminal or leaf-opposed paniculate cymes. Achenes minute, brown, sparsely hairy.

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Throughout, a weed in cultivated fields and in open waste lands. (SONASALI)

FLS & FRS : Aug.–Feb.

WEDELIA Jacq. nom. cons.

Wedelia urticaefolia DC. in Wt. Contrib. 18. 1834; FBI 3:306; C 2:98; S 133.

0.6–1.2 m tall, erect herbs. Leaves 6-17×2-7 cm, ovate or ovate-lanceolate, hispidly hairy. Heads 1.5–2 cm across, axillary fascicled and in terminal racemes. Achenes 0.4–0.5 cm long, obovate-triangular or cuneate, faintly ribbed, nearly glabrous.

Dangs (Malegaon–Saputara) and Vyara; rare.

FLS & FRS : Sep.–Dec.

XANTHIUM L.

Xanthium strumarium L. Sp. Pl. 987. 1753; FBI 3:303; C 2:94; Ch & O 128; S & J 29; S 132.

40–130 cm tall, annual herbs. Leaves 2.5-13×1.2-14 cm, broadly ovate-triangular, appressedly hairy. Heads 0.4–0.8 cm across, greenish-yellow, in terminal and axillary, 2–4 cm long spikes. Fruit 1.4–2.3 cm long, ellipsoid or oblong, pale-to dark-brown. Achenes 0.8–1 cm long, smooth, glabrous, oblong, somewhat compressed.

Throughout; common and abundant, often gregarious (GOKHRU, GADARIYU)

FLS & FRS : Throughout the year.

GOODENIACEAE 68

SCAEVOLA L. nom. cons.

Scaevola taccada (Gaertn.) Roxb. Hort. Beng. 15. 1814 (nomen) & Fl. Ind. 1:527. 1832; Baker in Fl. Java 2:453. 1965; S & J 29. *Lobelia frutescens* Mill. Gard. Dict. ed. 8. no. 1. 1768. *Lobelia taccada* Gaertn. Fr. 1:119. t. 25. 1798. *Scaevola koenigii* Vahl, Symb. Bot. 3:36. 1794; FBI 3:421; C 2:128; Blatter in Journ. Bombay nat. Hist. Soc. 18:774. 1908. *Scaevola frutescens* auct. non Krause, 1912; WI 9:244.

Shrubs up to 1 m tall. Leaves 6–10×1.5–5.5 cm, alternate, obovate, sessile, glabrous. Flowers few, in axillary cymes.

Saurashtra and Kutch, along sandy coast.

FLS & FRS : July–Aug.

CAMPANULACEAE 69

Key to genera

1. Flowers in compact, conical spikes; capsules circumscissile .. .. *Sphenoclea*
1. Flowers in paniculate cymes; capsules not circumscissile :
   2. Corolla deep-blue; stigma capitate; capsule apically 3–5-valvular dehiscent .. .. *Wahlenbergia*
   2. Corolla nearly white; stigma lobed; capsule laterally dehiscent at base or sides below the calyx teeth .. .. *Campanula*

CAMPANULA L.

Campanula colorata Wall. ex Roxb. Fl. Ind. (ed. Carey) 2:101. 1832; Rau in Bull. Bot. Surv. India 10 (Suppl. 2):45. 1969. *Campanula canescens* Wall. ex DC. Prodr. 7:474. 1838 (non Roth 1827). *Campanula benthami* Wall. ex DC. Prodr. 7:473. 1838; Kitamura, Fl. Afgh. 377.1960.

A perennial, erect or suberect, slender herb. Leaves radical and cauline, subsessile, elliptic-ovate or obovate-oblong, hairy. Flowers nearly white.

Chhotaudepur forest division; very rare.

FLS : Nov.–Dec.

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SPHENOCLEA J. Gaertn. nom. cons.

Sphenoclea zeylanica Gaertn. Fruct. 1:113. t. 24. f. 5. 1788; FBI 3:438; C 2:134.

Erect, glaucous-green, 15-60 cm tall herbs. Leaves 2.5-9 × 0.6-2.2 cm, elliptic-lanceolate, glabrous. Flowers white, in 1-5 cm long spikes. Capsule glabrous, nearly globose. Seeds minute, ellipsoid, brown, rugose.

Reported by Saxton & Sedgwick (1918) from north Gujarat (Talod).

FLS & FRS : Oct.

WAHLENBERGIA H. A. Schrad. ex Roth nom. cons.

Wahlenbergia marginata (Thunb.) A. DC. Mon. Campanulaceae 143. 1830; S 140. *Campanulata marginata* Thunb. Fl. Jap. 89. 1784. *Wahlenbergia gracilis* Schrad Blumenb. 38. in obs. 1827; FBI 3:429; C 2:133.

35-40 cm tall, perennial herbs. Leaves 2.5-8 × 0.2-1 cm, linear-oblong or oblong-oblanceolate, pubescent beneath. Flowers blue. Capsule turbinate, glabrous.

Dangs (Unai and Ambapada; river beds); rare.

FLS & FRS : Mar.

LOBELIACEAE 70

LOBELIA L.

Key to species

1. Prostrate or procumbent herbs, upto 45 cm tall; flowers axillary, solitary; corolla 0.4-0.7 cm long :
   2. Seeds trigonous; anthers of all stamens penicellate; stem not winged or wings obscure .. .. *L. alsinoides*
   2. Seeds ellipsoidal, compressed; anthers of two stamens penicillate; stem winged .. .. .. *L. heyneana*
1. Erect, stout herbs, 1-3.2 m tall; flowers in terminal racemes; corolla 2.5-4 cm long .. .. .. *L. nicotianaefolia*

Lobelia alsinoides Lam. Encycl. 3:583. 1791; S & J 29; S 140. *Lobelia trigona* Roxb. Hort. Beng. 85. 1814 (nomen) & Fl. Ind. 2:111. 1824; FBI 2:423; C 2:130.

Annual, slender, subfleshy herbs. Leaves 0.7-2.2 × 0.6-2 cm, broadly ovate or nearly orbicular, glabrous. Flowers blue or bluish-purple. Capsule glabrous, wrinkled, nearly globose or oblong. Seeds minute, brown, glabrous.

Dharampur, Dangs, Vyara, Tuwa and Saurashtra in drying moist ground; not common.

FLS & FRS : Sep.-Mar.

Lobelia heyneana R. & S. Syst. Veg. 5:50. 1819; S 139. *Lobelia trialata* Ham. ex D. Don, Prodr. Fl. Nep. 157. 1825; FBI 3:425; C 2:130.

Reported from Ratanmahals by Bedi. (1969).

Lobelia nicotianaefolia Roth ex R. & S. Syst. Veg. 5:47. 1819; FBI 3:427; C 2:131; WI 6:21.

Dangs (Waghai), listed by Santapau (1954-1955).

FLS & FRS: Mar.

PLUMBAGINACEAE 71

Key to genera

1. Styles 5, nearly united :
   2. Leaves perfoliate; calyx eglandular, deeply 5-fid, 5-nerved, winged between veins .. .. *Dyerophytum*
   2. Leaves not perfoliate; calyx glandular, tubular, 5-nerved, not winged between nerves.. .. ..*Plumbago*
1. Style 5, free .. .. *Limonium*

DYEROPHYTUM O. Ktze.

Dyerophytum indicum (Gibs. ex Wt.) O. Ktze. Rev. Gen Pl. 3:394. 1891; Rau in Bull. bot. Surv. India 10 (Suppl. 2): addenda. 1969. *Vogelia indica* Gibs. ex Wt. in Cal. Journ. nat. Hist. 7: 17. 1847; FBI 3:481; C 2:138; S & J 29.

Scanned by CamScanner

Erect, suffruticose herbs or undershrubs. Leaves 3.8-8× 2.2-5.6 cm, sessile, ovate, ovate-elliptic or nearly orbicular. Flowers in 2–10 cm long, branched spikes. Capsule 0.6-0.8 cm long, 5-valved, glabrous. Seeds brown, pyriform, smooth, glabrous.

Rajpipla, Pavagadh, north Gujarat (Idar, Ambaji) and Saurashtra; occasional. (PAVI)

FLS & FRS : Oct.–Jan.

LIMONIUM Mill.

Limonium stocksii (Boiss.) O. Ktze. in Rev. Gen. Pl. 1:396. 1891; S & J 29. *Statice stocksii* Boiss. in DC. Prodr. 12:664. 1848; FBI 3:480; C 2:136.

15–25 cm tall, suffrutescent herbs or undershrubs. Leaves 1–1.8×0.4–1 cm, flat, fleshy, glabrous or sparsely hairy, spathulate-oblong. Flowers in branched spikes. Fruits indehiscent or operculate dehiscent.

Listed by Cooke (1958) and Santapau & Janardhanan (1967) from Saurashtra; also from Kutch along sea coast.

FLS & FRS : Dec.–Mar.

PLUMBAGO L.

Plumbago zeylanica L. Sp. Pl. 151. 1753; FBI 3:480; C 2:136; WI 8:163. f. 58; Ch & O 134; S & J 29; S 140.

Slender, olivaceous-green, 60–100 cm tall undershrubs. Leaves 2–10×1–5 cm, glabrous. Flowers white or pale-blue, in 7–25 cm long, terminal spikes. Capsule 0.8–1 cm long, oblong, 5-valved. Seeds oblong, glabrous, smooth.

Throughout in hedges not common. (CHITRAK, CHITRO)

FLS & FRS : Throughout the year.

PRIMULACEAE

ANAGALLIS L.

Key to species

1. Corolla blue to bluish-red, longer than calyx; filaments hairy; leaves opposite.. .. .. ..*A. arvensis* var. *coerulea*
1. Corolla white or pink, shorter than calyx; filaments glabrous; leaves alternate.. .. ..*A. pumila*

Anagallis arvensis L. var. **coerulea** (Schreb.) Gren. & Godr. Fl. France 2:467. 1852; Ch & O 134; S & J 29. *Anagallis arvensis* L. Sp. Pl. 148. 1753; FBI 3:506; C 2:139; WI 1:75 (omne p. p.). *Anagallis coerulea* Schreb. Fl. Lips. 5.1771.

Erect or procumbent, slender herbs, 5–15 cm tall. Leaves 0.6–1.5×0.4–1 cm, ovate, glabrous, sessile. Flowers bright-blue, axillary, solitary. Capsule 0.3–0.35 cm across, globose or ovoid, circumscissile. Seeds minute trigonous, brown.

A weed in cultivated fields throughout in plains.

FLS & FRS : Dec.–Mar.

Anagallis pumila Sw. Prodr. Veg. Ind. Occ. 1:40. 1788; Santapau & Shah in Journ. Bombay nat. Hist. Soc. 17:20. 1965; S 140. *Centunculus tenellus* Duby in DC. Prodr. 8:72. 1844; FBI 3:506; C 2:140.

Tiny herbs. Leaves 0.4–0.6×0.2–0.3 cm, ovate or obovate, glabrous. Flowers axillary, solitary. Capsule circumscissile. Seeds many, trigonous, dark-brown.

Dangs, a weed in cultivated fields; rare.

FLS & FRS : Nov.–Dec.

MYRSINACEAE

Key to genera

1. Lianas, without milky sap; flowers greenish-yellow in racemes; fruit globose; seeds endospermic; not mangroves....*Embelia*
1. Trees, with milky sap; flowers white, umbellate; fruit cylindric, curved; seeds non-endospermic; mangroves.. ..*Aegiceras*

AEGICERAS Gaertn.

Aegiceras corniculata (L.) Blanco Pl. Philip. 79. 1837; WI 1133. *Rhizophora corniculata* L. Stickm. Herb. Amb. 13.1754 & Amoen. Acad. 4:123. 1759. *Aegiceras majus* Gaertn. Fruct. 1:216. t 46. 1788; FBI 3:533; C 2:147.

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3-5 m tall, evergreen trees. Leaves 3-10×1.7-4.5 cm, coriaceous, glabrous, obovate-oblong. Fruits 3.5-5 cm long, glabrous, cinnamon-brown.

Along sea coasts of Kutch and Saurashtra.

FLS : Dec.-Apr. *FRS* : May-July

EMBELIA Burm. f.

Embelia tsjeriam-cottam (R. & S.) DC. in Trans. Linn. Soc. 17:131. 1834; WI 3:168. f. 107; S 141. *Ardisia tsjeriam-cottam* R. & S. Syst. 5:418. 1819-1820. *Embelia robusta* Brand. For. Fl. 2:284. 1874; FBI 3:515; C 2:144.

Twining shrubs with smooth, brown bark. Leaves 5-14.5 × 2.6-7 cm, elliptic or elliptic-lanceolate, seldom obovate, glabrous, punctate. Racemes 2-7 cm long. Fruit 0.4-0.5 cm across, deep -red or purple, minutely veined.

Dangs; rather rare. (AMBATI, VAVADING)

FLS : July-Aug. *FRS* : Aug.-Dec.

SAPOTACEAE

Key to genera

1. Deciduous trees; leaves crowded at ends of branches; flowers at ends of leafless branches; calyx lobes 4-5; stamens 12 or more in two whorls, all fertile .. .. .. *Madhuca*
1. Evergreen trees; leaves spread on branches; flowers along with leaves; calyx lobes 6-8; fertile stamens 6-8 with as many staminodes :
   2. Flowers tetramerous, fragrant; calyx lobes 8; fertile stamens 8; sterile stamens entire, lanceolate .. .. *Mimusops*
   2. Flowers trimerous, not fragrant; calyx lobes 6; fertile stamens 6; sterile stamens minute, toothed, or laciniate or well developed and petaloid .. .. *Manilkara*

MADHUCA J. F. Gmel.

Madhuca indica J. F. Gmel. Syst. Nat. 2:799. 1791; WI 6: 207. t. 9. ff. 71-74; S & J 30; S 141. *Bassia latifolia* Roxb. Pl. Cor. 1:20. t. 19. 1795; FBI 3:544; C 2:152. *Madhuca latifolia* (Roxb.) Macbride in Contrib. Gray Herb. (N. S.) 53:18. 1918; Bor 233.

10-15 m tall; bark black, greyish-black or ash-coloured, longitudinally fissured. Leaves 5.5-25×2-13.5 cm, coriaceous, elliptic or elliptic -oblong, at length glabrous. Flowers creamy-white, in dense, axillary fascicles. Berries 2.5×1.8×1 cm, ovoid, fleshy, yellow when ripe. Seeds 2.5-3.7 cm long, ovoid, smooth, shining, brownish-black.

Throughout in dry deciduous forests, less frequent in scrub forests (MAHUVO, MAHUDO)

FLS & FRS : Mar.-June

MANILKARA Adans. nom. cons.

Key to species

1. Corolla lobes 18-24; sterile stamens toothed or laciniate but not petaloid .. .. *M. hexandra*
1. Corolla lobes 6; sterile stamens petaloid, minutely toothed .. .. *M. zapota*

Manilkara hexandra (Roxb.) Dub. in Ann. Mus. Coll. Marseille 3:9. f. 2. 1915; WI 6:298. ff. 99-100; Ch & O 135; S & J 30. *Mimusops hexandra* Roxb. Pl. Cor 1:16. t. 15. 1795; FBI 3:549; C 2:155.

10-15 m tall trees; bark greyish-black or blackish-brown, rough, deeply longitudinally furrowed. Leaves 2.5-11×1-6 cm, coriaceous, elliptic-oblong or obovate-oblong. Flowers creamy-white, axillary, in fascicles of 2-6. Berries 1-1.7 cm long, ovoid or ellipsoid 1(2)- seeded, smooth, with plenty of latex. Seeds 1-1.2 cm long, ovoid, smooth, shining black.

Wild or self sown near villages, throughout in plains. (RAYANA)

FLS : Sep.-Oct. *FRS* : Nov.-Apr.

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Manilkara zapota (L.) van Royen in Blumea 7:410 1953; S & J 30. *Achras zapota* L. Sp. Pl. 1190. 1753 & (ed. 2) 470. 1762; FBI 3:534; C 2:156; WI 1:23; Bailey 790.

Bark brown, rough, logitudinally fissured. Leaves 5.5–10 × 2–4 cm coriaceous, oblong-lanceolate or elliptic-oblong, glabrous. Flowers dull-white, solitary, axillary. Fruits 4.5–7×3–4.5 cm, ovoid or ellipsoid, rusty-brown. Seeds 1.5–2 cm long, hard, shining, black, smooth, glabrous, ellipsoid, acute.

Planted in gardens and in orchards. (CHIKOO)

FLS & FRS : Throughout the year.

MIMUSOPS L.

Mimusops elengi L. Sp. Pl. 349. 1753; FBI 3:548; C 2:155; WI 6:383. ff. 141–142; S & J 30.

3–10 m tall trees; bark grey or nearly light black, smooth. Leaves 6.5–11.5×2.5–6 cm, elliptic or elliptic-lanceolate, glabrous. Flowers white, fragrant, axillary, in fascicles of 2–6. Fruits 2–3.5 cm long, yellow, smooth, ellipsoid, 2-seeded.

Planted in gardens and along roads. (BAKUL, BAKULI)

FLS : June-Oct. *FRS* : Oct.–Mar.

EBENACEAE

Key to genera.

1. Leaves subopposite and alternate; corolla of male flowers tubular .. .. *D. melanoxylon*
1. Leaves alternate; corolla of male flowers campanulate :
   2. Calyx of male flowers glabrous outside; staminodes 4; bark grey or light-black, nearly smooth.. ..*D. montana*
   2. Calyx of male flowers pubescent outside; staminodes 7–9 or 12; bark blackish-brown or dark-brown, longitudinally fissured :
      3. Calyx of male flowers pubescent within; staminodes 12; fruit 2–2.5 cm across .. .. .. *D. cordifolia*
      3. Calyx of male flowers glabrous within; staminodes 7–9; fruits 0.6–0.8 cm across .. .. .. *D. chloroxylon*

Diospyros chloroxylon Roxb. Pl. Cor. 1:38. t. 49. 1795; FBI 3:560; C 2:166; WI 3:77.

Straight or crooked, 6–10 m tall trees, with irregularly, longitudinally fissured bark. Leaves 2.2–4×1–2 cm, elliptic, elliptic-oblong, obovate or nearly orbicular, subcoriaceous, appressed-hairy. Male flowers axillary, 4–10-fascicled. Female flower axillary, solitary. Drupes globose, glabrous. Seeds oblong, reddish-brown, glabrous.

Surat along banks of Tapti (cf. Cooke) and Rajpipla (Gumandev-Zaghadia road); rare.

FLS : Oct.–Dec. *FRS :* Dec.–Mar.

Diospyros cordifolia Roxb. Pl. Cor. 1:38. t. 50. 1795 & Fl. Ind. 2:538. 1832; FBI 3:555; C 2:165.

Armed, 3–5 m tall shrubs or small trees. Leaves 2.3–8.5× 1-2.5 cm, oblong, ovate-oblong or ovate-lanceolate, almost glabrous. Flowers creamy-white, axillary, males in cymes of 3, female solitary. Drupe globose, yellow when ripe.

South Gujarat (Broach) and many parts of central and north Gujarat; frequent in hedges. (DHEKI)

FLS : Feb.–Apr. *FRS :* Apr.–July or throughout the year.

Diospyros melanoxylon Roxb. Pl. Cor. 1:36. t. 46. 1795; FBI 3:564; C 2:159; WI 3:81. f. 44; S & J 30.

12–15 m tall trees. Leaves 4–20×3–10 cm, ovate-oblong, elliptic-oblong or elliptic-lanceolate, seldom obovate, hairy beneath. Male flowers 3–12, in axillary, pendulous cymes, female solitary. Drupes 2–3.5 cm across, ovoid or subglobose, yellow when ripe, glabrous.

Throughout, frequent in deciduous forests. (TIMBRU, TIMBERVO)

FLS : Mar.–May *FRS :* Apr.–Aug.

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Diospyros montana Roxb. Pl. Cor. 1:37. t. 48. 1795; FBI 3:555 (p. p.); C 2:165; WI 3:84.

6–12 m tall, armed trees. Leaves 3–5.5×1.5–3 cm, broadly ovate-oblong or elliptic, nearly glabrous. Flowers greenish-white, axillary, males few, in cymes.

Dangs; very rare.

FLS : Mar.

OLEACEAE

Key to genera

1. Trees or shrubs; fruit a capsule :
   2. Fruit flat; leaves simple, rough; corolla tube orange; bark pale-blackish-brown, rough .. .. .. *Nyctanthes*
   2. Fruit pyriform, woody; leaves compound; corolla tube not as above; bark ash-coloured or greenish-grey, smooth .. .. *Schrebera*
1. Twiners; seldom erect shrubs and then corolla tube not orange; fruit a berry, two lobed or one-lobed by reduction .. .. *Jasminum*

JASMINUM L.

Key to species

1. Leaves simple; petiole not tendrillar; calyx hairy..... :
   2. Bracts linear-subulate; leaves glabrous ....*J. malabaricum*
   2. Bracts foliaceous; leaves pubescent .. .. .. *J. multiflorum*
1. Leaves compound; petiole tendrillar; calyx glabrous ...*J. flexile*

Jasminum flexile Vahl, Symb. Bot. 3:1. 1794; FBI 3:601; C 2:175; WI 5:282.

Woody climbers, with rough bark. Leaves 3-foliolate; leaflets 1.2–7×1–3.7 cm, ovate, ovate-lanceolate, glabrous. Flowers white, in terminal and axillary cymes.

Ornamental, seldom an escape. (JUI)

FLS : Throughout the year.

Jasminum malabaricum Wt. Icon. t. 1250. 1848; FBI 3:594; C 2:172; WI 5:283; S 143.

Twiners. Leaves 2.9–12.5×2–9.5 cm, glabrous, ovate or nearly orbicular. Flowers white or creamy-yellow, in terminal cymes. Fruits ovoid or globose, dark-purple or nearly black, shining.

Sanjan, Bulsar (in hedges) and Dangs; rare. (JANGLI JUI)

FLS & FRS : Feb.–June

Jasminum multiflorum (Burm. f.) Andr. Bot. Rep. 8. t. 496. 1801; WI 5:284. f. 150; S & J 30; S 144. *Nyctanthes multiflora* Burm. f Fl. Ind. 5. t. 3. f. 1. 1768. *Jasminum pubescens* Willd. Sp. Pl. 1:37. 1797; FBI 3:592; C 2:173.

Silky-pubescent, twining shrubs. Leaves 2.5–7.5×1.8–5.3 cm, ovate or nearly orbicular, appressed-silky hairy. Flowers white, in terminal and axillary, dense panicles. Fruits not seen.

Cultivated for flowers; reported wild from Dangs by Santapau (1955). (MOGRO, JUI)

FLS : Throughout the year.

Nyctanthes arbortristis L. Sp. Pl. 6. 1753; FBI 3:603; C 2:176; Bor 278; WI 7:69; S & J 30; S 144.

3–8 m tall trees, seldom shrubs. Leaves 3–14×1.2–9.5 cm, coriaceous, scabridly hairy, ovate-elliptic or ovate-lanceolate. Flowers fragrant, in trichotomously cymose, pedunculate, capitate heads. Capsule 1–2×0.8–1.8 cm, obcordate-oblong or nearly orbicular, prominently reticulate. Seeds obovate, black, flat, glabrous.

Wild at Rajpipla, Chhotaudepur, Panchmahals, Mahi ravines, and north Gujarat; also cultivated; common (PARIJATAK, CHEDDI, HARISINGAR).

FLS & FRS : Aug.–Feb., often throughout the year.

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SCHREBERA Roxb. nom. cons.

Schrebera swietenioides Roxb. Pl. Cor. 2: 1. t. 101. 1798; FBI 3:604; C 2:177; S & J 30; WI 9:255. f. 81.

12–18 m tall trees. Leaflets 7–9, 9–18×4.5–9.5 cm, broadly ovate, ovate-oblong or elliptic-oblong, glabrous, subcoriaceous. Flowers 0.7–1 cm across, white, mildly fragrant, in terminal and axillary, trichotomously paniculate cymes. Fruits 2.6–6.5 cm long, greenish-yellow, blackish-brown and spotted white when dry.

Dangs, Vyara, Rajpipla, Chhotaudepur, Pavagadh, Panchmahals, Saurashtra; rare. (MOKHA, MOKH).

FLS : Jan.–Mar. *FRS :* Apr.–Dec.

SALVADORACEAE

Key to genera

1. Plants armed, dioecious; petals nearly free; ovary 2-celled .. .. *Azima*
1. Plants unarmed; flowers bisexual; petals united; ovary 1-celled .. .. *Salvadora*

AZIMA Lam.

Azima tetracantha Lam. Encycl. 1:343. 1783; FBI 3:620; C 2:183; WI 1:142.

Armed, bushy shrubs. Leaves 2.5–5×1–2.4 cm, elliptic, coriaceous, glabrous, petiolate; spines usually 4, 1.5–3.5 cm long, pubescent or glabrous. Flowers small, greenish-white, sessile, males numerous, in crowded, axillary fascicles, females solitary or geminate.

A typical member of the scrub forest; common in hedges and in open grounds in north Gujarat.

FLS : Apr.–June

SALVADORA Garcin ex L.

Key to species

1. Leaves broadly ovate to ovate-lanceolate.. .. *S. persica*
1. Leaves linear-oblong to linear-lanceolate.. .. *S. oleoides*

Salvadora oleoides Decne. in Jacq. Voy. Bot. 140. t. 144. 1844; FBI 3:620; C 2:183; Bor 229; S & J 30; WI 9:193. f 61.

An evergreen, large shrub or a small tree, with sarmentose branches and rough, grey bark. Leaves 7–8.5×0.7–1 cm, dull green, somewhat fleshy, glabrous. Flowers greenish-white, in axillary, 2–7 cm long, paniculate racemes. Drupes globose, glabrous, 0.2–0.3 cm across.

In scrub forests in hedges; not very frequent. (PILUDI)

FLS & FRS : Nov.–Mar.

Salvadora persica L. Sp. Pl. 122. 1753; FBI 3:619; C 2:182; Bor 229; S & J 30; WI 9:194.

An evergreen tree, 2.5–4 m tall, with straight or crooked trunk and dull grey to greyish-white or greyish-brown bark. Leaves 1.5–7×0.8–3.5 cm, glabrous, fleshy. Flowers greenish-yellow, in axillary and terminal, 4–20 cm long panicles. Drupes 0.2–0.3 cm across, spherical, fleshy, pink to deep-purple.

Throughout, in plains; common. (PILVO, PILUDI)

FLS & FRS : Nov.–Feb.

APOCYNACEAE

Key to genera

1. Extensive woody twiners or with sarmentose branches :
   2. Armed; flowers white; berries 4–8-seeded .. .. *Carissa*
   2. Unarmed; flowers yellow, if white, anthers exerted :
      3. Flowers white, 1.5–2 cm across; anthers exerted; milky latex not abundant; leaves gland-dotted; bark light-grey-coloured .. .. *Vallaris*
      3. Flowers bright-yellow, 8–10 cm across; anthers included; milky latex abundant; leaves not gland-dotted; bark reddish-brown .. .. *Allamanda*
1. Plants erect, seldom diffuse, but not twining or sarmentose :

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4. Trees or shrubs :

5. Leaves alternate; corolla infundibuliform or salver-shaped :

6. Plants evergreen; bark light-black or ash-coloured; leaves linear-lanceolate; calyx glandular within; corolla infundibuliform; fruit a drupe .. .. *Thevetia*

6. Deciduous, soft-wooded plants; bark light greenish or dirty-grey; leaves obovate to oblanceolate; sepals eglandular within; corolla salver-shaped, white with yellow eye, occasionally rose-coloured without, or completely reddish-purple; fruit a pair of follicles .. .. *Plumeria*

5. Leaves opposite or ternate; corolla salver-shaped :

7. Leaves ternate; coronary scales in the form of a ring around the mouth of corolla tube; anthers included, tipped with long, hairy appendage; flowers white, red or rose-coloured; seeds oblong, comose at tip .. .. *Nerium*

7. Leaves opposite; coronary scales around mouth of corolla tube present or not; anthers included or not; seeds linear to linear-oblong, comose or not :

8. Corolla with coronary scales; anthers exerted; seeds comose at lower end.. .. *Wrightia*

8. Corolla without coronary scales; anthers included; seeds comose or not :

9. Deciduous; leaves not dark-green and shining; follicles linear-cylindric; many-seeded; seeds comose at apex.. *Holarrhena*

9. Evergreen; leaves dark-green, shining above; follicles few-seeded, beaked, stout, coriaceous; seeds not comose, embedded in an orange-coloured aril .. *Ervatamia*

4. Undershrubs or herbs, if shrubs then leaves 3–4, ternate and anther tip without hairy appendage :

10. Leaves ternate; flowers in cymes; fruit a drupe.. .. .. *Rauvolfia*

10. Leaves opposite; flowers axillary, solitary or paired; fruit a follicle.. .. .. *Catharanthus*

ALLAMANDA L.

Allamanda cathartica L. var. **hendersonii** Bailey, Stand. Encycl. Hort. 1:246. 1914 & Man. Cult. Pl. 810. 1949. *Allamanda cathartica* auct. non L. (nisi pro parte); C 2:207; WI 1:56.

An evergreen shrub, with rambling branches. Leaves 7–12 × 1.8–5 cm, opposite or ternately 3–4 at each node, elliptic-oblong, obovate or oblanceolate, leathery, nerves hairy beneath. Cymes axillary and terminal. Fruits not seen.

Ornamental, native of trop. America.

FLS: Throughout the year.

CARISSA L. nom. cons.

Carissa congesta Wt. Icon. t. 1289, 1848; Ch & O 136; S & J 30. *Carissa carandas* auct. non L. 1767; FBI 3:630 (p. p.); C 2:186; WI 2:82. f. 38; Bor 280.

Evergreen shrubs; bark light-grey or yellowish-brown, rough, scaly. Leaves 2.1–7 × 1–5 cm, coriaceous, elliptic-oblong or ovate-oblong, rarely obovate, glabrous. Cymes terminal, paniculate. Berries 1–1.4 cm long, ovoid-oblong or ellipsoidal, glabrous, deep-purple or nearly black when ripe.

In deciduous forests; occasional; also in scrub forests; rather rare. (KARVANDA, KARAMDA)

FLS: Feb.–June *FRS*: Apr.–June.

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CATHARANTHUS G. Don.

Key to species

1. Herbs; leaves lanceolate; flowers 0.7–1 cm across .. .. *C. pusillus*

1. Undershrubs; leaves elliptic–oblong or obovate; flowers 2.5–4 cm across .. .. *C. roseus*

Catharanthus pusillus (Murr.) G. Don, Gen. Syst. 4:95. 1837; S & J 31. *Vinca pusilla* Murr. in Act. Götting. 3:66. t. 2. f. 1. 1773; FBI 3:640. *Lochnera pusilla* (Murr.) K. Schum. in Pfam. 4(2): 145. 1895; C 2:191; WI 6:162. f 55.

An erect or diffuse herb, 10–20 cm tall Leaves 1.8–7.5 × 0.4–2.2 cm, glabrous. Flowers white, axillary, solitary, sessile. Follicles 3–5 cm long, linear, paired, straight, glabrous, subtorulose, shortly beaked. Seeds black, cylindric, rounded at ends, muriculate, prominently 3–5–ribbed, ventrally excavated.

Throughout among grasses and cultivated fields; occasional.

FLS : Aug.–Dec. *FRS* : Sep.–Dec.

Catharanthus roseus (L.) G. Don, Gen. Syst. 4:95. 1837; S & J 31; S 147. *Vinca rosea* L. Syst. Nat. (ed. 10) 944. 1759; FBI 3:640. *Lochnera rosea* (L.) Reichb. Consp. Reg. Veg. 134. 1828; C 2:192; WI 6:163. Pl. 6.

Perennial undershrubs, 20–40 cm tall, with cinnamon–brown bark. Leaves 2–6.5×1–2.3 cm, glabrous. Flowers white, rosy or lilac, solitary or geminate, axillary. Follicles 1.5–4.5 cm long, paired, narrowly linear, longitudinally ribbed, shortly beaked. Seeds black, cylindric, ribbed.

Ornamental, at times an escape; common ;native of West Indies. (BARMASI, SADAFULI)

FLS & FRS : Throughout the year.

ERVATAMIA Stapf

Ervatamia divaricata (L.) Burkill in Rec. bot. Surv. India 10:320. 1925. *Nerium divaricatum* L. Sp. Pl. 209. 1753 (quoad syn. Pl. Zeyl. excl. syn. Hermann). *Nerium coronarium* Jacq. Coll. 1:138. 1786. *Ervatamia coronaria* (Jacq) O. Stapf in This.–Dyer, Fl. Trop. Afr. 4:127. 1902; C 2:197; WI 3:192. f. 122. *Tabernaemontana coronaria* Willd. Enum. Hort. Berol. 275. 1809; FBI 3:646. *Tabernaemontana divaricata* (L.) R. Br. in R. & S. Syst. Veg. 4:427. 1819; S & J 31; S 148.

1.5–3.5 m tall shrubs. Leaves 3.5–15×1–5 cm, elliptic–lanceolate, glabrous. Flowers white, 2–3 cm across, in terminal, paniculate cymes. Fruits not seen.

Planted in gardens at many places. (CHANDNI, TAGGAR)

FLS : Throughout the year.

HOLARRHENA R. Br.

Holarrhena antidysenterica (L.) Wall ex G. Don, Gen. Syst. 4:78. 1837; FBI 3:644; C 2:195; Bor 283; WI 5:103. Pl. 5 & f. 64; Ch & O 137; S & J 31; S 147. *Nerium antidysentericum* L. Sp. Pl. 209. 1753. *Echites antidysenterica* Heyne ex Roth, Nov. Pl. Sp. 138. 1821.

Large shrubs or small trees, 3–6 m tall; bark light–blackish–brown, irregularly fissurred. Leaves 2.5–30×1.5–14 cm, broadly ovate or elliptic, nearly glabrous at length. Flowers white, in terminal cymes. Follicles 20–30 cm long, dark–green, studded with white or brown specks Seeds linear–oblong, compressed, brown, faintly ribbed, pubescent, pale–silky–brown, comose.

In deciduous forests, common; also in scrub forests. (INDRAJAV, KADVO INDRAJAV, KUDO)

FLS : Jan.–June *FRS* : Mar.–Dec.

NERIUM L.

Nerium indicum Mill. Gard. Dict. (ed. 8) no. 2. 1768; WI 7:15. Pl. 3 (col.); Ch & O 138; S & J 31; S 150. *Nerium odorum* Soland. apud. Ait. Hort. Kew 1:297. 1789; FBI 3:655; C 2:206.

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Evergreen shrubs, 2–3 m tall. Leaves 5.5–20×0.7–2.5 cm, linear–lanceolate or elliptic–lanceolate, sparsely hairy beneath. Racemose cymes 10–20 cm long. Follicles 5.5–17×0.7–10 cm, cylindric or oblong–lanceolate, straight, ribbed.

Ornamental, seldom an escape. (LALKAREN, KAREN)

FLS & FRS : Throughout the year.

PLUMERIA L.

Plumeria rubra L. Sp. Pl. 209. 1753; Woodson in Ann. Miss. Bot. Gard. 25:297. 1938. *Plumeria acuminata* Ait. Hort. Kew. (ed. 2) 2:70. 1811; Bor 282; S 149; WI 8:164. f. 57. *Plumeria acutifolia* Poir. in Lam. Encycl. Suppl. 2:667. 1812; FBI 3:641; C 2:206. *Plumeria rubra* L. forma *acuminata* (Ait.) Santapau & Irani ex Shah in Journ. Univ. Bombay 30:35 1961–1962.

5–10 m tall trees, with plenty of milky juice. Leaves 10–35×4–10.5 cm, glabrous, crowded at ends of branches. Flowers fragrant, 3–5 cm across, in terminal cymes. Fruits not seen.

Ornamental; native of tropical America. (CHAMPO, KHAD CHAMPO)

FLS : Throughout the year.

RAUVOLFIA L.

Rauvolfia tetraphyila L. Sp. Pl. (ed. 1) 208. 1753. *Rauvolfia canescens* L. Sp. Pl. (ed. 2) 303. 1762; C 2:190; WI 8:391.

Shrubs, 1–2 m tall, slender. Leaves 2.5–8×1–4.5 cm, 3–4 –nately whorled, elliptic–obovate or oblong, softly pubescent. Flowers white, in terminal cymes. Drupes 0.3–0.4 cm across, globose, red or violet when ripe.

As an escape at some places e. g. Baroda, Surat and Bulsar; native of West Indies.

FLS & FRS : May-Jan.

THEVETIA L. nom. cons.

Thevetia peruviana (Pers.) Merrill in Phil. Journ. Sci Bot. 9:130. 1914; S & J 31; S 150. *Cerbera peruviana* Pers. Syn. 1:267. 1805. *Thevetia neriifolia* Juss. ex Steud. Nom. (ed. 2) 2:680. 1841; C 2:207.

Large shrubs or small trees. Leaves 4.4–13×0.6–1.2 cm, glabrous, sessile or subsessile. Flowers pale–to bright–yellow, 3–4 cm across, in axillary, few–flowered cymes. Drupes 2.4–3.5 cm long, ellipsoid–oblong, obscurely 4–angled, glabrous.

Planted at some places as ornamental or a hedge; native of tropical America. (PILIKAREN)

FLS & FRS : Throughout the year.

VALLARIS Burm. f.

Vallaris solanacea (Roth) O. Ktze. Rev. Gen. Pl. 2:417. 1891; Bor 284. *Peltanthera solanacea* Roth, Nov. Pl. Sp. 132. 1821. *Vallaris heynei* Spr. Syst. 1:635. 1824; FBI 3:650; C 2:199.

Twining or straggling shrubs. Leaves 5–11×2–2.5 cm, elliptic or ovate–oblong, glabrous. Flowers 3–10, in axillary, lax cymes. Fruits not seen.

Planted; also an escape on hedges.

FLS : Throughout the year.

WRIGHTIA R. Br.

Key to species

1. Leaves almost glabrous; coronary scales fimbriate; follicles 2, 30–65 cm long, slender, smooth, olivaceous–green, not grooved at junction of carpels, free except at tips.. .. *W. tinctoria*
1. Leaves tomentose; coronary scales not fimbriate; follicles 2, 15–35 cm long, stout, united throughout their length, pale –brownish–black, rough with white tubercles, grooved at junction of carpel.. .. .. *W. tomentosa*

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Wrightia tinctoria R. Br. in Mem. Wern. Soc. 1:73. 1811; FBI 3:653; C 2:200; Bor 284; Ch & O 137; S & J 31.

5-10 m tall, deciduous trees, with milky latex and light -greyish-black, rough, longitudinally fissurred bark. Leaves 3.5 -16×1.5-7.5 cm, elliptic-lanceolate or elliptic-oblong. Flowers 1-1.5 cm across, creamy-white, in terminal, paniculate cymes. Follicles linear-cylindric, glabrous. Seeds brown, glabrous, longitudinally striate, short beaked, bearing coma much longer than seed.

In deciduous forests; common; very rarely in scrub forests. (KUDI, RUNCHALO DUDHLO)

FLS : Dec.-June *FRS* : Throughout the year.

Wrightia tomentosa R. & S. Syst. Veg. 4:414. 1819; FBI 3:653; C 2:199; Bor 285; Ch & O 137; S & J 31.

6-12 m tall trees, with yellowish-grey or ash-coloured bark. Leaves 3.5-11×1.8-5.5 cm, elliptic-oblong or ovate-oblong. Flowers creamy-white, 1.4-1.8 cm across, in terminal, tomentose, paniculate cymes. Fruits stout, cylindric. Seeds narrowly linear -oblong, with coma much longer than seed.

Dangs, Rajpipla, Pavagadh, Chhotaudepur, not common; also Khedbrahma where only one tree seen. (DUDHLO).

FLS : Dec.-July *FRS* : Jan.-Sep.

ASCLEPIADACEAE

Key to genera

1. Plants leafless .. .. *Sarcostemma*
1. Plants leafy :
   2. Corolla tubular; corolla tube inflated near base, straight or ventricose, funnel-shaped at mouth; corolla lobes free at apex; plants often tuberous.. .. .. *Ceropegia*
   2. Corolla not as above; plants without root stocks :
      3. Corona biseriate, outer coronary, inner staminal; flowers greenish-yellow :

4. Follicles solitary, smooth, glabrous, not longitudinally wrinkled when dry; anther tips not membranous .. .. *Leptadenia*
4. Follicles paired, velvety-tomentose, reddish-brown, when dry longitudinally wrinkled .. *Marsdenia*

3. Corona biseriate and staminal; flowers rosy-purple or reddish- purple within; follicle solitary or paired :
   5. Leaves ovate, deeply cordate; follicles echinate .. .. *Pergularia*
   5. Leaves linear to linear-lanceolate; follicles not echinate .. .. *Oxystelma*

3. Corona uniseriate :
   6. Corona of 5 villous, fleshy, coronary lobes.. .. *Gymnema*
   6. Corona not as above :
      7. Plants erect or suberect :
         8. Pollinia erect; follicle solitary.. .. *Tylophora*
         8. Pollinia pendulous; follicles paired :
            9. Stem and leaves glabrous; leaves lanceolate; corolla rotate, dark-red, lobes reflexed; corona bright-yellow .. .. .. *Asclepias*
            9. Stem and leaves fugaciously cottony-hairy; leaves elliptic-oblong or obovate; corolla rotate but corolla lobes not reflexed; lobes pale-to bright-violet, rarely white; corona colour as that of lobes; follicles boat-shaped .. .. *Calotropis*
      7 Plants twining or trailing :
         10. Flowers purple, reddish-purple or pale-brown within :
            11. Pollinia pendulous :
               12. Corona membranous, lobed or a ring with toothed margins; staminal column without wings; leaves linear or elliptic-oblong.. .. .. .. *Cynanchum*

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12. Coronary ring fleshy; anthers with horny appendages, so that staminal column appears winged; leaves broadly ovate .. .. .. *Holostemma*

11. Pollinia erect.. .. .. *Tylophora*

10. Flowers pure creamy-white, yellow or greenish-yellow or at times with purple spots (*Cosmostigma*) :

13. Corolla rotate, tube very short :

14. Pollinia pendulous .. .. *Pentatropis*

14. Pollinia erect :

15. Coronary lobes fleshy adnate only to the base of staminal column, somewhat spiny at tip .. .. *Dregea*

15. Coronary lobes adnate to the length of staminal column, somewhat membranous, with rounded teeth like scales at tip .. .. *Cosmostigma*

13. Corolla salver-shape, tube about 1 cm long .. .. *Telosma*

ASCLEPIAS L.

Asclepias curassavica L. Sp. Pl. 215. 1753; FBI 4:18; C 2:245; WI 1:131; S 158.

45–100 cm tall, suffruticose herbs. Leaves 8–11 × 1.2–2 2 cm, membranous. Cymes extra-axillary, umbellate. Follicles 5–8 × 0.8–1 cm, ovate-lanceolate, glabrous, beaked. Seeds 0.4–0.6 cm, boadly ovate, glabrous, with silky-white coma.

An ornamental in botanical gardens; native of America.

FLS & FRS : Throughout the year. (SISIGS)

CALOTROPIS R. Br.

Key to species

1. Corolla-buds ovoid; corona-lobes shorter than the staminal column, with two obtuse auricles just below the apex.... .. .. *C. gigantea*

1. Corolla-buds hemispherical; corona lobes equalling or longer than staminal column without auricles below the apex.... .. .. *C. procera*

Calotropis gigantea (L.) R. Br. in Ait. Hort. Kew (ed. 2) 2:78. 1811; FBI 4:17; C 2:214; WI 2:20. f. 14; Ch & O 139; S & J 31; S 151. *Asclepias gigantea* L. Sp. Pl. 214. 1753.

3–4 m tall shrubs; latex milky, abundant; bark ash-coloured, shallowly longitudinally fissurred. Leaves 4–11 × 2–6 cm, sessile or subsessile, thick, glaucous-green. Flowers 2–4 cm across, in terminal and lateral, umbellate cymes. Follicles paired, 7–10 × 3-4 cm, glaucous-green, cottony-pubescent. Seeds flat, with 2-3 cm long coma.

Throughout; common. (AKADO).

FLS & FRS : Throughout the year.

Calotropis procera (Ait.) R. Br. in Ait. Hort. Kew. (ed. 2) 2:78. 1811; FBI 4:18; C 2:215; Ch & O 139; S & J 31. *Asclepias procera* Ait. Hort. Kew (ed. 1) 1:305. 1789.

Very similar to the previous species but differs in the structure and size of coronal lobes with reference to the gynostemium.

Throughout; common. (AKADO, NANO AKADO: NANI RUI).

FLS & FRS : Throughout the year.

CEROPEGIA L.

Key to species

1. Leaves fleshy .. .. *C. bulbosa*

1. Leaves subcoriaceous or membranous :

2. Roots nodulose; leaves and flower stalks glabrous; corolla tube inflated near base.. .. .. .. *C. candelabrum*

2. Roots tuberous; leaves and flower stalks hairy; corolla tube not inflated at base.. .. .. *C. odorata*

Ceropegia bulbosa Roxb. Pl. Cor. 1:11. t. 7. 1795 & Fl. Ind. 2:28. 1824; FBI 4:67; C 2:240; WI 2:125; S & J 31.

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Twining, slender, perennial herbs, with an underground, tuberous stem. Leaves 2.5-4.5×1.5-2.6 cm, orbicular, elliptic-oblong, ovate-oblong or obovate, glabrous. Flowers 6-10, in lateral, umbellate cymes. Corolla 1.5-2 cm long, tube greenish-grey outside; purplish inside, lobes 5, dark-purple. Follicles 8.5-9 cm long, glabrous

Throughout in plains on hedges; frequent.

FLS & FRS : July-Dec.

Ceropegia candelabrum L. Sp. Pl. 211. 1753; Bedi, Sabnis & Bhatt in Journ. Bombay nat. Hist. Soc. 65:524. 1968. *Ceropegia tuberosa* Roxb. Pl. Cor. 1:12. t. 9. 1795; C 2:241 (excl. loc.). *Ceropegia intermedia* Hk. f. in Hk. f. FBI 4:71. 1883.

Twining, perennial, slender herbs. Leaves 3-7×1-2.5 cm, ovate-oblong or elliptic-oblong, nearly glabrous. Flowers in lateral umbellate cymes. Follicles paired, 10-14×0.5-0.7 cm, cylindric, tapering at apex, glabrous. Seeds 0.8×0.25 cm, ovate-oblong, margined with 2-2.5 cm long coma.

So far reported from Pavagadh hill.

FLS & FRS : Aug.-Nov.

Ceropegia odorata Hk. f. in Hk. f. FBI 4:75. 1883; Sabnis & Bedi in Kew Bull. 25:57-60. 1971.

Twining herbs, with slender, glabrous or sparsely hairy stem. Leaves upto 9.5 cm long and 0.5-2.5 cm broad, membranous, hispid, petiolate. Flowers 2-2.5 (-8) cm long, pale-yellow with purple tinge. Fruits not seen.

So far reported from Pavagadh.

FLS : Sep.

COSMOSTIGMA Wt.

Cosmostigma racemosum (Roxb.) Wt. Contrib. 42.1834; FBI 4:46; C 2:232; WI 2:300; S & J 31; S 155. *Asclepias racemosa* Roxb. Fl. Ind. 2:32. 1832.

Perennial twiners. Leaves 6.5-14.5×5-12 cm, broadly ovate, glabrous. Racemose cymes axillary or sublateral. Follicles solitary or paired, 14×5 cm, ovate-oblong, glabrous. Seeds 1.2×0.8 cm, ovate, brown, dark-coloured in middle.

So far from Saurashtra.

FLS : June-Aug. *FRS* : Oct.-Dec.

CYNANCHUM L.

Cynanchum callialata Ham. ex Wt. Contrib. 56. 1834; FBI 4:24; C 2:221; S & J 31.

Slender twiners. Leaves 4.5-7.5×1.8-5 cm, glabrous. Flowers in lateral, axillary, umbellate cymes. Follicles 5-7.5 cm long, lanceolate, marginally winged, glabrous. Seeds 0.8×0.5 cm, broadly ovate, margined, glabrous, brown.

So far from Saurashtra.

FLS & FRS : Oct.

DREGEA E. Meyer nom. cons.

Dregea volubilis (L. f.) Bth. ex Hk. f. in FBI 4:56. 1883; S & J 31; S 154 *Asclepias volubilis* L. f. Suppl 170. 1781. *Marsdenia volubilis* (L. f.) Cooke, Fl. Pres. Bombay 2:106. 1904.

Extensive, perennial, woody twiners, with watery sap. Leaves 4.5-15×2.5-11 cm, broadly ovate, glabrous or nearly so. Flowers dark-green or yellowish-green, in lateral, pendulous umbels. Follicles paired, 2-10×1.2-4.3 cm, ovate, velvety-hairy, reddish-brown, wrinkled when ripe. Seeds 1-1.2×0.6-0.7 cm, pale-yellow or straw-coloured.

Throughout in the forests, but not frequent. (DODI, MOTIDODI, MALTI)

FLS : Apr.-Aug *FRS* : Aug.-Jan.

GYMNEMA R. Br.

Gymnema sylvestre (Retz.) Schult. in R. & S. Syst. Veg. 6:57. 1819; FBI 4:29; C 2:224; WI 4:276. f. 139; S & J 31. *Periploca sylvestre* Retz. Obs. 2:15. 1781

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A much branched twining shrub, with longitudinally fissured, blackish-brown bark. Leaves 2.3-4.5×1-2.6 cm, ovate, ovate-elliptic or ovate-oblong, hairy. Flowers minute, greenish-yellow or tinged pink, in lateral, umbellate cymes. Fruits not seen.

Seen once in Chhotaudepur forest division (Dughtha); it is also listed from Saurashtra. (MADHUNASINI)

FLS : Aug.

HOLOSTEMMA R. Br.

Holostemma annularium (Roxb.) K Schum. in Engler & Prantl, Pfam. 4(2):247, 250. t. 71 J-K. 1895; WI 5:111; S & J 31; S 152. *Asclepias annulare* Roxb. Hort. Beng. 20. 1814 (nomen) & Fl. Ind. 2:37. 1824. *Holostemma rheedei* Wall. Pl. As. Rar. 2:51. 1831; FBI 4:21. *Holostemma rheedianum* Cooke, Fl. Pres. Bombay 156. 1904 & 2:220 1958 reprinted (non Spr. 1825).

Extensive climbers, with plenty of latex; stem sparingly branched, glaucous-green. Leaves 5.5-15.5×3.5-10 cm, broadly ovate, somewhat fleshy. Flowers 2-3.5 cm broad, in pendulous, umbellate cymes. Follicles 9-12×3.5-6 cm, boat-shaped, glabrous. Seeds 0.5-0.7×0.4-0.7 cm, ovate, flat, glabrous, with 3-3.5 cm long coma

In the forests of Rajpipla, Chhotaudepur, Panchmahals and Saurashtra; rare. (KHIRDODI, KHANER, KHIRVEL)

FLS : Aug.-Oct. *FRS :* Sep.-Oct.

LEPTADENIA R. Br.

Key to species

1. Leafy, twining shrubs .. .. *L. reticulata*
1. Leafless, erect shrubs; (leaves present on young shoots and very caducous) .. .. *L. pyrotechnica*

Leptadenia pyrotechnica (Forsk.) Decne. in Ann. Sci. Nat. 9:270. 1838; WI 6:73; S & J 31. *Cynanchum pyrotechnicum* Forsk. Fl. Aegypt.-Arab. 53. 1775. *Leptadenia spartium* Wt. Contrib. 48. 1834; FBI 4:64; C 2:237.

Bushy shrubs, 45-75 cm tall. Leaves when present 4.5-8.5×0.2-0.3 cm, narrowly linear or linear-lanceolate, sessile. Flowers greenish-yellow, in axillary fascicles. Follicles 7.5-14 cm long, ovate-conical to ovate-lanceolate, glabrous. Seeds 0.5-0.7 cm long, ovate-lanceolate, glabrous; coma 3-4 cm long.

So far found at Broach, in Mahi ravines, Chhotaudepur, Panchmahal, north Gujarat, Saurashtra and Kutch, rare. (KHIP, RANSER)

FLS & FRS : Aug.-Jan.

Leptadenia reticulata (Retz.) W. & A. in Wt. Contrib. 47. 1834; FBI 4:63; C 2:237; WI 6:73. f. 30; Ch & O 140; S & J 31. *Cynanchum reticulatum* Retz. Obs. 2:15. 1781.

Twiners, with watery sap and deeply fissured bark. Leaves 1.8-10×0.6-7.5 cm, ovate to ovate-lanceolate, glabrous. Flowers greenish-yellow, in axillary fascicles. Follicles 6-10 cm long, oblong or broadly lanceolate, dark-green, on drying pale-brown, beaked. Seeds 0.8-1 cm long, ovate, glabrous; coma 3-4 cm long.

Throughout on hedges or trailing on ground; common (DODI; KHIRDODI; NANI DODI)

FLS & FRS : Throughout the year.

MARSDENIA R. Br.

Marsdenia tenacissima (Roxb.) Moon, Cat. Pl. Ceylon 21.1824; W. & A. Contrib. 41.1834; FBI 4:35; C 2:230; WI 6:305. *Asclepias tenacissima* Roxb. Pl. Cor. 3:35. t. 240. 1890.

Extensive, woody twiners; bark ash- or grey-coloured. Leaves 7-14.5×5.5-11 cm, broadly ovate, densely hairy. Flowers greenish-yellow, in umbellate cymes arranged in a panicle. Follicles 14-15×4-4.5 cm, ovate-lanceolate, prominently margined, glabrous, smooth, wrinkled on drying.

So far found in dense forests of Dangs, Vyara, Rajpipla, Chhotaudepur and Vireshwar; not common.

FLS : June-July *FRS :* July

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OXYSTELMA R. Br.

Oxystelma secamone (L.) Karst. Deuts. Fl. 1031. 1880–1883; WI 7:200. f. 81; S & J 31. *Periploca secamone* L. Mant. 2:216. 1771. *Periploca esculenta* L. f. Suppl. 168. 1781. *Oxystelma esculentum* J. & A. Schult. Syst. Veg. 6:89. 1819; FBI 4:17; C 2:216.

A perennial, twining herb, with milky latex. Leaves 3–11 ×0.2–1.2 cm, glabrous. Flowers 2–2.5 cm broad, creamy-white outside, pink to reddish-purple within, in axillary, pendulous, umbellate cymes. Follicles 3.5–7×1–1.8 cm, glabrous, ovate-lanceolate. Seeds numerous ±0.1 cm, ovate to subrotund, flat, slightly margined; coma 1.2–1.8 cm long.

Throughout everywhere; not common. (JAL-DUDHI; DUDHLI)

FLS & FRS : Aug.–Oct.

PENTATROPIS R. Br.

Key to species

1. Flower buds subglobose; corolla lobes triangular without tail; coronal lobes equalling or nearly so to the staminal column, curving outwards to an acute base ..... *P. capensis*
1. Flower buds acuminate; corolla lobes narrowly linear, tailed; coronal lobes shorter than staminal column, deltoid-ovate with subtruncate base .. .. *P. spiralis*

Pentatropis capensis (L. f.) Bullock in Kew Bull. 1955: 284. 1955; WI 7:308; Ch & O 141; S & J 31. *Cynanchum capense* L. f. Suppl. 168. 1781. *Pentatropis microphylla* W. & A. in Wt. Contrib. 52.1834; FBI 4:20; C 2:218.

Twining herbs. Leaves 1.2–2.2×0.8–1.2 cm, ovate to ovate-oblong, glabrous. Cymes lateral, umbellate, few-flowered. Follicles 2.5–4×0.6–0.8 cm, ovate-lanceolate or ovate-oblong, thickly margined, glabrous; coma 1.5–2 cm long.

Bulsar, Pavagadh, north Gujarat, Saurashtra and Kutch. (SHINGROTI)

FLS & FRS : Aug.–Dec.

Pentatropis spiralis (Forsk.) Decne. in Ann. Sci. Nat. 9:327. t. 11 E. 1838; FBI 4:19; WI 7:308; Ch & O 141; S & J 31. *Asclepias spiralis* Forsk. Fl. Aegypt.-Arab. 49.1775. *Pentatropis cynanchoides* R. Br. in Salt. Voy. Abyss. Append 64. 1814; C 2: 218.

Slender twiners. Leaves 0.8–5.5×0.4–4.5 cm, ovate, ovate-lanceolate or elliptic-oblong, glabrous. Cymes lateral umbellate, 5–7-flowered. Follicles 3–7 cm long, glabrous, lanceolate. Seeds 0.4–0.5 cm long, ovate-oblong, flat.

Throughout on hedges (except Kutch).

FLS & FRS : Dec.–Aug.

PERGULARIA L.

Pergularia daemia (Forsk.) Chiov. Res. Sci. Miss. Stefan.-Panoli Somali. Ital. 1:115. 1916; WI 7:309. f. 137; Ch & O 140; S & J 32. *Asclepias daemia* Forsk. Fl. Aegypt.-Arab. 51. 1775. *Daemia extensa* R. Br. in Mem. Wern. Soc. 1:50. 1809; FBI 4:20; C 2:219.

Perennial, herbaceous twiner, with milky juice. Leaves 1.8–8.5×1.4–9.3 cm, broadly ovate, densely hairy beneath. Flowers creamy-yellow with deep-purple spot within at base, in lateral, drooping, umbellate cymes. Follicles 6.5–9×1.5–1.8 cm, hairy, lanceolate, softly echinate. Seeds 0.6 0.7×0.4–0.5 cm, broadly ovate, velvety-hairy; coma 3–5 cm long.

Throughout; common and abundant (CHAMAR DUDHELI, NAGLA DUDHELI, AMER DUDHELI)

FLS & FRS: Oct.–Mar.

SARCOSTEMMA R. Br.

Sarcostemma acidum (Roxb.) Voigt, Hort. Sub. Calc. 542. 1845; S & J 32; WI 9:235. f. 73. *Asclepias acida* Roxb. Fl. Ind. 2:31. 1832. *Sarcostemma brevistigma* W. & A. in Wt. Contrib. 59.1834; FBI 4:23; C 2:222.

Scanned by CamScanner

Much branched, leafless, climbing, succulent shrubs; bark ash-coloured, smooth. Flowers fragrant, creamy-white, sessile, in terminal, umbellate cymes. Follicles 8–10 cm long, lanceolate, glabrous. Seeds 0.4×0.3 cm, ovate, flat, with 1.5–1.8 cm long coma.

Kutch, Saurashtra and north Gujarat, often trailing on rocks. (SOM)

FLS & FRS : June–Oct.

TELOSMA Cav.

Telosma pallida (Roxb.) Craib in Kew Bull. 1911: 418. 1911; Ch & O 142; S & J 32. *Asclepias pallida* Roxb. Hort. Beng. 20. 1814 (nomen) & Fl. Ind. 2:83 1824. *Pergularia pallida* W. & A. in Wt. Contrib. 42.1834; FBI 4:38; C 2:229.

Extensive, twining undershrubs. Leaves 3.8–10×2.3–7 cm, broadly ovate or ovate-elliptic, membranous, glabrescent. Cymes lateral, umbellate. Follicles 8–10×1.5–2 cm., lanceolate, beaked. Seeds 0.7–0.9×0.4–0.5 cm, ovate-oblong, pale-brown, with 2–2.5 cm long coma.

Throughout on hedges (except Kutch) during monsoon. (VARSHA DODI).

FLS : July-Oct. *FRS :* Aug.–Oct.

TYLOPHORA R. Br.

Key to species

1. Stem suberect .. .. *T. fasciculata*
1. Stem twining :
   2. Corona wholly adnate to the staminal column without free points above :
      3 Leaves obtuse; petiole 0.4–0.6 cm, long; corolla 0.5–0.6 cm long .. .. *T. rotundifolia*
      3. Leaves acute to acuminate; petiole 1–1.5 cm long; corolla 0.3–0.5 cm long .. .. *T. dalzellii*
   2. Corona apex free, point reaching as high as style apex .. .. *T. indica*

Tylophora dalzellii Hk. f. in Hk. f. FBI 4:43. 1883; C 2:227; S & J 32; S 154. *Tylophora carnosa* Dalz. & Gibs. Bombay Fl. 150. 1861 (non Wt. 1834).

A perennial, sparingly hairy or glabrous herb, with milky sap. Leaves 3.5–11.5×2.5–6 cm, ovate–oblong or ovate–lanceolate, nearly glabrous. Flowers deep-purple or reddish-brown, in axillary, umbellate cymes. Follicles 8–10 cm long, lanceolate, tapering at apex, glabrous. Seeds 0.6–0.8×0.4–0.5 cm, ovate-oblong or ellipsoidal, flat, with 1.8–2 cm long coma.

Dangs (Malegaon–Saputara forest range), rare; also listed from Saurashtra.

FLS : July

Tylophora indica (Burm. f.) Merrill in Philip. Journ. Sci. 19:373. 1921; S & J 32; S 153. *Cynanchum indicum* Burm. f. Fl. Ind. 70. 1768. *Tylophora asthmatica* W. & A. in Wt. Contrib. 51. 1834; FBI 4:44; C 2:228.

Perennial, suffruticose herbs or undershrubs, with yellowish sap. Leaves 7–10×4–5.5 cm, ovate–oblong or elliptic–oblong, glabrous. Flowers 1–1.5 cm across, in axillary, umbellate cymes. Follicles 6–7×0.7–1 cm, lanceolate. Seeds 0.6–0.8×0.3–0.4 cm, ovate-oblong or broadly ovate, brown, darker in centre, with 2–2.5 cm long coma.

Cultivated at Vallabh Vidyanagar and Surat; also listed from Saurashtra. (DAMNI VEL)

FLS & FRS : July–Dec.

Tylophora fasciculata Ham. in Wt. Contrib. 50. 1834; FBI 4:40; C 2:226.

20–40 cm tall, suffruticose, stout, tuberous herbs, with watery sap. Leaves 1.5–5.5×0.8–3 cm, ovate to ovate–lanceolate, sparsely hairy on nerves beneath. Flowers small, chocolate-brown, in axillary, simple or paniculate umbels or racemose cymes.

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Follicles 3–5×2–2.5 cm, ovate or spindle-shaped, striate, glabrous. Seeds 0.6–0.7 cm long, ovate or oblong, flat, with 1.2–1.5 cm long coma.

Dangs, Chhotaudepur and Panchmahals.

FLS & FRS : Aug.–Sep.

Tylophora rotundifolia Ham. in Wt. Contrib. 50. 1834; FBI 4:43; C 2:227.

Perennial, mostly unbranched, hairy herbs. Leaves 4.5–8× 3.8–6.8 cm, coriaceous, broadly ovate or subrotund, petiolate, margins hairy. Flowers numerous, in axillary, umbellate cymes.

Listed by Thaker et al. (1970–71) and Bedi (1969) from Chhotaudepur and Devgadh Baria Forest divisions respectively.

FLS : Jan.–July (see also Santapau & Irani, 1960).

PERIPLOCACEAE 80

Key to genera

1. Flowers white or pale- to dark-violet-purple, 6–8 cm across; corolla tube as long as or longer than corolla lobes.. .. .. *Cryptostegia*
1. Flowers brownish-yellow, pale-yellow, creamy-white or greenish outside, purplish within, upto 2 cm across; corolla tube shorter than corolla lobes :
   2. Erect shrubs or undershrubs, leafless; leaves when present 0.6–1 × 0.3–0.5 cm; corona lobes 5, connate.. .. *Periploca*
   2. Twiners; leaves much larger in size than size given above; corona lobes 5, free :
      3. Lamina with many lateral veins which are united to form prominent intramarginal nerves; flowers white or creamy-yellow; corolla lobes 0.8–1 cm long, contorted to the right.. ... . *Cryptolepis*
      3. Lamina with few lateral nerves and without intramarginal nerves; flowers brownish-yellow, corolla lobes valvate.. .. .. *Hemidesmus*

CRYPTOLEPIS R. Br.

Cryptolepis buchanani (L.) R. & S. Syst. Veg. 4:409. 1819; FBI 4:5; C 2:210; WI 2:385; Ch & O 142; S 151.

Woody twiner with plenty of latex; bark smooth, dark-brown, peeling off in scales. Leaves 5–18.5 × 2.2–10.5 cm, elliptic to elliptic-oblong, glabrous. Cymes terminal and axillary. Follicles 7–10 cm long, narrowly deltoid-conical, glabrous. Seeds 0 5–0.7 cm long, ovate-oblong, compressed; coma 2.5–3.5 cm long, silky-hairy.

Dharampur, Bulsar, Dangs, Vyara, Rajpipla, Pavagadh, Chhotaudepur and Panchmahals; not common

FLS : Apr.–Sep. *FRS :* June–Dec.

CRYPTOSTEGIA R. Br.

Cryptostegia grandiflora R. Br. in Bot. Reg. 5: t. 435. 1819; FBI 4:6; C 2:245; WI 2:387. f. 141.

Woody climbers, with plenty of latex. Leaves 6–9 × 3.5–4.5 cm, elliptic-oblong, coriaceous, glabrous. Cymes dichotomous or trichotomous. Follicles 10–12 × 3–3.5 cm, trigonous. Seeds 0.8 × 0.3 cm; coma 3–4 cm long.

Naturalized in many parts, but not common; native of tropical Africa. (RUBBER VEL)

FLS & FRS : Throughout the year.

HEMIDESMUS R. Br.

Hemidesmus indicus (L.) R. Br. in Ait. Hort. Kew. (ed. 2) 2:75. 1811; Schult. in R. & S. Syst. Veg. 6:216. 1819; FBI 4:5; C 2:210; WI 5:33. f. 23; S & J 32; S 150. *Periploca indica* L. Sp. Pl. 211. 1753.

Perennials, twining or trailing, with greenish-brown bark Leaves 2–13 × 0.6–4.8 cm, glabrous, linear to linear-lanceolate, elliptic-oblong or ovate-oblong. Flowers few, in axillary fascicles. Follicles 8–17 cm long, slender, striate, glabrous. Seeds 0.6–0.9 cm long, elliptic-oblong, compressed, glabrous.

Scanned by CamScanner

Throughout on hedges and in forests; not frequent. (DUDHVEL, DUDHLI, UPALSARI, SARIVA, ANANTMUL)

FLS :–Sep.–Feb. *FRS* : Nov.–June

PERIPLOCA L.

Periploca aphylla Decne. in Jacq. Voy. Bot. 109. t. 116. 1844; FBI 4:12; C 2:211; WI 7:313.

Plants with plenty of latex; bark greenish, wrinkled, longitudinally striate. Leaves oblong or ovate–oblong. Cymes axillary and terminal. Follicles 3.5–10 cm, cylindric-conical, beaked, at length glabrous. Seeds 0.5–0.6 cm long, oblong, reddish–brown, glabrous; coma 0.8–1.2 cm long, whitish.

Kutch; not common. (SINGDIO, RATI-KHIP, HOM, DUDHALI-KHIP)

FLS : July–Aug. *FRS* : July–Oct.

BUDDLEJACEAE

BUDDLEJA Houst. ex L.

Buddleja asiatica Lour. Fl. Cochinch. 72. 1790; FBI 4:82; C 2:248; WI 2:234.

A large, evergreen, hoary-tomentose shrub, 90–170 cm tall. Leaves 2.5–5.5×0.7–1.5 cm, lanceolate. Flowers white, fragrant, in dense, terminal and axillary, tomentose, 3–19 cm long, panicled cymes. Fruits not seen.

Dangs (vide Cooke); also from Baroda district (Nareshwar) along river Narmada (cf. Vyas, 1974); extremely rare.

FLS : March

LOGANIACEAE

Key to genera

1. Herbs; inflorescence di-tri-chotomous, each branch bearing 2–8 cm long unilateral spike; styles 2; fruit mitriform .. .. *Cynoctonum*
1. Trees or shrubs; inflorescence not as above; style 1; fruit not mitriform .. .. *Strychnos*

CYNOCTONUM Gmel.

Cynoctonum mitreola (L.) Britt. in Mem. Torry Bot. Club 5:258. 1894; S & J 32; S 158. *Ophiorhiza mitreola* L. Sp. Pl. 150. 1753. *Mitreola oldenlandioides* Wall. ex DC. Prodr. 9:9. 1845; FBI 4:79; C 2:246.

Annual, slender, 10–45 cm tall herbs. Leaves 2–9×0.8–4 cm, ovate–elliptic or elliptic–lanceolate, glabrous. Flowers white, terminal and axillary. Capsule 0.4–0.5 cm broad, two horned, glabrous.

In forest undergrowth (except Kutch), occasional. Vijaynagar

FLS & FRS : Sep.–Nov.

STRYCHNOS L.

Strychnos potatorum L. f Suppl. 148. 1781; FBI 4:90; C 2:251.

Leaves 5–8×2.5–4.6 cm, ovate to ovate-elliptic, glabrous. Flowers white in axillary, sessile cymes. Berries 1–1.5 cm across, globose, smooth, glabrous.

Forests of Lunawada and north Gujarat (Vireshwar); rare. R. I. Patel (1971) also cites central and north Gujarat as localities of its distribution. (KANTAS, NIRMAL, NIRMALI, NAIMEL)

FLS : May–May *FRS :* May–Nov.

GENTIANACEAE

Key to genera

1. Aquatic; leaves alternate; corolla lobes induplicate-valvate in bud .. .. *Nymphoides*
1. Terrestrial; leaves opposite; corolla lobes contorted:
   2. Ovary 2-celled .. .. *Exacum*
   2. Ovary 1-celled :
      3. Corolla lobes without pits, depressions or glands at base :

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4. Corolla regular :

5. Flowers white, in sessile, axillary clusters .. .. *Enicostema*

5. Flowers bright-rosy, seldom white, in terminal, dichotomous cymes .. .. .. *Centaurium*

4. Corolla irregular :

6. Flowers yellow; stigma scarcely lobed .. .. *Hoppea*

6. Flowers rose-coloured or pale-violet; stigma distinctly lobed .. .. *Canscora*

3. Corolla lobes with 1 or 2 pits, depressions or glands at base .. .. *Swertia*

CANSCORA Lam.

Key to species

1. Calyx winged :

2. Stem not winged or slightly winged; bracts minute, linear-lanceolate .. .. *C.concanensis*

2. Stem distinctly winged; bracts foliaceous, circular, perfoliate .. .. *C. perfoliata*

1. Calyx not winged :

3. Stem not or obsoletely winged .. .. .. *C. diffusa*

3. Stem winged :

4. Calyx sharply quadrangular; each sepal keeled .. .. *C. khandalensis*

4. Calyx not as above :

5. Pedicel not enlarged below calyx; corolla limb shorter than tube.. .. .. .. *C. decurrens*

5. Pedicel more or less enlarged below calyx; corolla limb equalling tube.. .. .. *C. pauciflora*

Canscora concanensis Cl. in Hk. f. FBI 4:104. 1883, C 2:258; Santapau & Shah in Journ. Bombay nat. Hist. Soc. 62 (2) :205. 1905.

Slender, erect, branched, glabrous herbs. Leaves 0.7–2.6 × 0.3–1.7 cm, upper leaves ovate, lower oblong. Flowers bright-purple, in terminal cymes. Capsule 0.4–0.5 cm long, glabrous, oblong or elliptic-oblong. Seeds numerous, minute, ovate, faintly reticulate.

Dangs, Pavagadh and Lunawada; not common.

FLS & FRS : Sep.

Canscora decurrens Dalz. in Kew Journ. Bot. 2:136. 1850; FBI 4:103; C 2:257; WI 2:65; Ch & O 144; S 161.

30–50 cm tall, slender herbs. Leaves ovate to ovate-lanceolate, membranous, sessile, decurrent along the stem for length of whole internode. Flowers pale-to bright-rosy-pink, in terminal cymes.

So far reported from Pavagadh; common on old walls of the fort on hill.

FLS & FRS : Oct.–Mar.

Canscora diffusa (Vahl) R. Br. Prod. 451. 1810 (in Obs); FBI 4:103; C 2:257; WI 2:65; Ch & O 144; S & J 32; S 161. *Gentiana diffusa* Vahl, Symb. Bot. 3:47. 1794.

Erect or diffuse, slender herbs, 8–45 cm tall. Leaves 1.2–7.5 × 0.6-6.5 cm, broadly ovate or ovate-elliptic, sessile, glabrous. Flowers pale-to bright-rosy-purple, numerous, in terminal, lax, dichotomous cymes. Capsules 0.5-0.7 cm long, cylindric or nearly oblong, dark-brown or nearly black, glabrous, smooth. Seeds numerous, minute, faintly reticulate.

Throughout (except Kutch) in damp places. (ZINKU-KARIATŪ)

FLS & FRS : Oct.–Mar.

Canscora khandalensis Santapau in Kew Bull. 1948:485. 1949; Ch & O 145; S & J 32; S 162.

10–25 cm tall, slender herbs. Leaves 4-6 × 2–2.5 cm, ovate to ovate-elliptic or lanceolate. Flowers bright-rosy, in terminal dichotomous cymes.

Scanned by CamScanner

Pavagadh and Saurashtra; fairly common on old walls of the fort on hill at Pavagadh.

FLS : Sep.-Oct.

Canscora pauciflora Dalzell in Kew Journ. Bot. 2:136. 1850; FBI 4:103; C 2:258; Ch & O 145; S 161.

Herbs. Leaves 0.5–1.5×0.3–0.6 cm, ovate, oblong or obovate. Flowers pale-rosy, in lax, dichotomous cymes.

So far reported from Pavagadh hill, among grasses.

FLS & FRS : Nov.

Canscora perfoliata Lam. Encycl. Meth. Bot. 1:601. 1785; FBI 4:104; C 2:258; S & J 32.

15–50 cm tall, annual herbs. Leaves 1.8–4×0.4–1 cm, oblong-lanceolate, those of branches orbicular, perfoliate, 0.6–1.5 cm broad, bract-like. Flowers bright-pink, in terminal cymes. Capsule 0.8–1.3 cm long. Seeds minute, numerous, pale-brown, glabrous.

Saurashtra.

FLS & FRS : Jan.-Feb.

CENTAURIUM St. Hil.

Centaurium centaurioides (Roxb.) Rolla Rao & Hemadri in Journ. Bombay nat. Hist. Soc. 67(2):357. 1970. *Chironia centaurioides* Roxb. Hort. Beng. 16. 1814 (nomen) & Fl. Ind. 1:548. 1832. *Erythrea roxburghii* G. Don, Gen. Syst. 4:206. 1837; FBI 4:102; C 2:255; WI 3:194. f. 123. *Centaurium roxburghii* (G. Don) Druce, Rep. Bot. Exch. Cl. Brit. Isles 4:614. 1916; S & J 32.

Slender, erect, 6–20 cm tall, annual herbs. Leaves 0.5–2.5×0.2–0.6 cm, ovate oblong or linear, sessile or nearly so. Capsule 0.6–0.8 cm long, ellipsoid-oblong, glabrous. Seeds many, small faintly reticulate.

Ulsar, Dangs, Vyara, Broach, Panchmahals, Saurashtra and Kutch, a weed in cultivated fields; not common. (ZINKU KARIATU)

FLS & FRS : Dec.-Mar.

ENICOSTEMA Bl. nom. cons.

Enicostema hyssopifolium (Willd.) Verdoon in Bothalia 7:762. 1961 & Bull. bot. Surv. India 5:291. 1963; S & J 32. *Exacum hyssopifolium* Willd. Sp. Pl. 1:640. 1798. *Enicostema littorale* Bl. Bijdr. 848. 1826; FBI 4:101; C 2:255; WI 3:174. *Enicostema verticillatum* auct. non *G. verticillare* L. 1753; Ch & O 143.

10–35 cm tall, simple or branched, erect or diffuse, glabrous herbs. Leaves 1-7×0.6-1.3 cm, linear to linear-oblong, sessile. Capsule 0.3–0.5 cm long, ellipsoidal-oblong, glabrous, smooth. Seeds numerous, minute, subglobose, brown, foveolate.

Throughout, mostly in plains among grasses and cultivated fields; common. (ZINKU KARIYATU, KADVINAI, MAMEJEVO)

FLS & FRS : June-Dec.

EXACUM L.

Key to species

1. Plants more than 30 cm tall, stout; flowers 4–6 cm across; corolla lobes white in lower half, pale- to deep-blue or bluish purple in upper half ... ... *E. bicolor*

1. Plants not more than 30 cm tall; flowers 0.7–1.2 cm across; corolla lobes pale-to deep-blue :

2. Pedicel stout; corolla lobes lanceolate, acute :

3. Leaves petiolate ... ... *E. petiolare*

3. Leaves sessile ... ... *E. pedunculatum*

2. Pedicel filiform; corolla lobes suborbicular, obtuse .. .. *E. pumilum*

Exacum bicolor Roxb. Hort. Beng. 83. 1814 (nomen) & Fl. Ind. 1:413. 1820; FBI 4:96; C 2:252; WI 3:234; S 199.

60–90 cm tall, glabrous herbs. Leaves 4–11.5×1-4 cm, ovate-lanceolate or elliptic. Flowers in dense, terminal cymes. Capsule

Scanned by CamScanner

0.7–1 cm long, ovoid or broadly ellipsoidal, smooth, shining. Seeds numerous, minute, globose or angular, pale-brown, microscopically reticulate.

Pavagadh, Dangs, Bulsar; rare.

FLS & FRS : Sep.–Oct.

Exacum pumilum Griseb. in DC. Prodr. 9:46. 1845; FBI 4:98; C 2:254; S & J. 32; S 160.

Glabrous herbs. Leaves 1.2–2.5×0.3–0.6 cm, sessile, linear-lanceolate. Flowers gentian-blue or violet, axillary, in lax cymes. Capsule 0.3–0.4 cm across, glabrous, subglobose or ovoid. Seeds numerous, minute.

Bulsar, Dangs and Saurashtra, among grasses.

FLS & FRS : Aug.–Sep.

Exacum pedunculatum L. Sp. Pl. 112. 1753; FBI 4:97; C 2:253; WI 3:234. f. 153.

Erect, glabrous herbs. Leaves 3–4.3×0.3–0.6 cm, elliptic-oblong. Flowers blue, in terminal cymes. Capsule globose, membranous, smooth, surrounded by persistent, winged calyx. Seeds minute, glabrous, pale-brown.

There is a specimen in the herbarium of Sardar Patel University collected near about Surat, without collecter's name.

FLS & FRS : Sept.

Exacum petiolare Griseb. in DC. Prodr. 9:46. 1845; FBI 4:98; Ch & O 143. *Exacum pedunculatum* L. var. *petiolare* Trim. Handb. Fl. Ceyl. 3:182. 1893; C 2:253.

Herbs. Leaves 1–3.5×0.6–1.8 cm, ovate or ovate-elliptic, membranous, glabrous. Flowers pale-blue, axillary, solitary and in terminal cymes.

Rajpipla, Pavagadh, Chhotaudepur, Panchmahals, north Gujarat and Saurashtra; rare among grasses.

FLS & FRS : Sep.–Oct.

HOPPEA Willd.

Hoppea dichotoma Willd. Ges. Naturf. Fr. Neue Schr. 3:434. 1801; FBI 4:100; C 2:256; WI 5:117; S & J 32.

5–15 cm tall herbs. Leaves 0.2–0.6 cm long, ovate, sessile, glabrous. Flowers pale-yellow, in terminal, dense, dichotomous cymes. Capsule 0.3–0.4 cm long, ellipsoid, glabrous, enclosed in persistent sepals. Seeds numerous, minute, oblong or subglobose, pale-to dark-green, muricate.

In moist places at many places (except Kutch); not common.

FLS & FRS : Sep.–Dec.

NYMPHOIDES Seguier

Key to species

1. Corolla more than 1.5 cm across; corolla lobes 5–7 :
   2. Corolla lobes hairy, fimbriate, densely papillose, not crested down the middle; seeds more than 10, smooth or very minutely tuberculate .. .. .. *N. indicum*
   2. Corolla lobes not as above, crested down the middle; seeds 6–10, prominently tuberculate .. *N. cristatum*
1. Corolla not more than 1.5 cm across; corolla lobes 4.. .. .. *N. parvifolium*

Nymphoides cristatum (Roxb.) O. Ktze. Rev. Gen. Pl. 429. 1891; S 162. *Menyanthes cristata* Roxb. Pl. Cor. 2:3. t. 105. 1798. *Limnanthemum cristatum* Griseb. Gen. & Sp. Gentianaceae 342. 1839 FBI 4:131; C 2:261; WI 6:114. f. 42 .

Herbs. Leaves 6–12.5×2.3–11.5 cm, floating, almost orbicular, entire, glabrous. Flowers white, pedicellate, in axillary clusters. Capsule 0.8–1.2 cm long, ellipsoid-oblong, apiculate, glabrous, pale-brown. Seeds minute, slightly compressed, pale-yellow.

In ponds in many parts except Saurashtra and Kutch. (POYANA, KUMUDINI)

FLS & FRS : Oct.–Mar.

Scanned by CamScanner

Nymphoides indicum (L.) O. Ktze. Rev. Gen. Pl. 2:429. 1891; S 163. *Menyanthes indica* L. Sp. Pl. 145. 1753. *Limnanthemum indicum* (L.) Griseb. emend. Thw. Enum. Pl. Zeyl. 205. 1860; FBI 4:131; C 2:261; WI 6:115. f. 43.

Stoloniferous herbs. Leaves 3.5–20 × 3.5–22 cm, glabrous, orbicular or nearly so, with wide sinus. Flowers white, pedicellate, in axillary fascicles. Capsules 0.6–0.8 cm long, straw-coloured, ellipsoid–oblong, glabrous. Seeds many, shining, yellow.

Throughout in ponds at many places except Saurashtra and Kutch. (POYANA, KUMUDINI)

FLS & FRS : Oct.–Mar.

Nymphoides parvifolium (Griseb.) O. Ktze. Rev. Gen. Pl. 2:429. 1891. *Limnanthemum parvifolium* Griseb. in DC. Prodr. 9:141. 1845; FBI 4:132; C 2:261.

Perennial, rhizomatous herbs. Leaves of 2 kinds, radical ones in rosette, 1.5–2 cm long and almost as much broad, spathulate or deltoid, cauline ones ovate–oblong. Flowers white, pedicellate, in axillary clusters. Capsule 0.4 × 0.2 cm, oblong, 15–more-seeded. Seeds round or lenticular, minutely tuberculate.

Surat in a pond (vide Cooke).

FLS & FRS : Not given by Cooke.

SWERTIA L.

Swertia minor (Griseb.) Cooke, Fl. Pres. Bombay 2:193. 1905 & 2:259, 1958; S 162. *Ophelia minor* Griseb. in DC. Prodr. 9:126. 1845. *Pleurogyne minor* Cl. in Hk. f. FBI 4:120. 1883.

Annuals, 10–25 cm tall, erect, with 4-gonous, winged stems. Leaves 0.5–1.2 × 0.4–0.8 cm, ovate, membranous, glabrous, sessile. Flowers 0.7–0.9 cm across, bluish-purple, axillary, solitary or 2–3-fascicled and in terminal, paniculate cymes. Capsules 0.25–0.3 cm long, ovoid.

So far only at Dangs (Malegaon) among grasses; locally common.

FLS & FRS : Aug.

HYDROPHYLLACEAE

HYDROLEA L. nom cons.

Hydrolea zeylanica (L.) Vahl, Symb. Bot. 2:46. 1791; FBI 4:133; C 2:263; WI 5:147. f. 93; S 163. *Nama zeylanica* L. Sp. Pl. 226. 1753.

Prostrate, procumbent or suberect herbs, glandular-hairy atleast in younger parts. Leaves 1.5–6 × 0.4–1.5 cm, narrowly lanceolate. Flowers deep-blue or purple-violet, 1–1.2 cm across, in condensed, hairy racemes. Capsule 0.4–0.6 cm long, ovoid –oblong or ellipsoid, enclosed in persistent calyx. Seeds numerous, minute, oblong, glabrous.

In drying moist ground at Dharampur, Bulsar, Dangs, Vyara, Chhotaudepur, Panchmahals and north Gujarat.

FLS & FRS : Nov.–Feb.

EHRETIACEAE

Key to genera

1. Flowers in terminal and axillary, dichotomous cymes; styles 2 or if style one bifid, at times each stylar branch forked :
   2. Stylar branches forked; drupe 1.5–2 cm across (except *C. gharaf*); endocarp 4-1-seeded; calyx persistent, accrescent in fruit; flowers more than 1 cm broad.....*Cordia*
   2. Stylar branches not forked; drupe 0.3–0.6 cm across, 2-seeded or of 1-seeded 4 pyrenes; calyx not or scarcely enlarged in fruit; flowers 0.3–0.8 cm across.. ..*Ehretia*

1. Flowers axillary, solitary or terminal, in cymes of 2–3 or racemes; style one :
   3. Flowers pale-to bright-purple or rose-coloured, 2–3 in very short cymes; ovary entire; drupe of 4,1-seeded pyrenes .. ..*Rotula*
   3. Flowers white, in axillary and terminal racemes; ovary 4-lobed; nutlets 4.. .. ..*Sericostomma*

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CORDIA L.

Key to species

1. Leaves alternate (seldom subopposite in *C. macleodii*), 3-5 -nerved from base :
   2. Leaves hoary-tomentose beneath :
      3. Leaves on upper surface with impressed nerves; calyx ribbed.. .. .. *C. macleodii*
      3. Leaves not as above on upper surface; calyx not ribbed :
         4. Upper surface of leaves smooth, without white discs (cystoliths); filaments hairy at base.. ..*C. wallichii*
         4. Upper surface of leaves with white discs; filaments not hairy at base :
            5. Average leaves more than 8 cm long..*C. domestica*
            5. Average leaves not more than 8 cm long .. .. *C. monoica*
   2. Leaves not tomentose beneath .. .. *dichotoma*
1. Leaves opposite or subopposite, pinnately veined :
   6. Leaves 1.1-2.1 × 0.8-1.5 cm, elliptic-obovate, upper surface without white discs; flowers few, in racemose cymes .. .. *C. perrottetii*
   6. Leaves 4-10.5 × 1.2-2.6 cm, oblanceolate-oblong, upper surface with white discs; flowers in terminal and axillary cymes .. .. *C. gharaf*

Cordia dichotoma Forst. f. Prodr. 18. 1786; WI 2:346; Bor 274; Ch & O 145; S & J 32; S 161. *Cordia myxa* auct. plur. non L.; FBI 4:136; C 2:265.

9-13.5 m tall trees, with ash-coloured or blackish-brown, rough bark. Leaves 7-18.5×5-13 cm, broadly ovate, elliptic-oblong or suborbicular, coriaceous, glabrous. Flowers creamy-yellow or nearly white, in axillary and terminal cymes. Ripe drupes 1.5-2.2 cm across, ovoid or rounded, glabrous, mucilagenous, bright-yellow with pinkish tinge.

Throughout (except Kutch). (VADGUNDO, BHOKAR, GUNDO, MOTO GUNDO)

FLS : Feb.-June *FRS* : Mar.-June

Cordia domestica Roth, Nov. Pl. Sp. 123. 1821; S & J 33. *Cordia fulvosa* Wt. Icon. 4(2):15. t. 1380. 1850; FBI 4:140; C 2:267.

Small trees, fulvous or grey-tomentose at least in younger parts. Leaves 5.3-16×5.2-13.5 cm, broadly ovate to ovate-oblong or nearly orbicular. Flowers in terminal and axillary, grey or whitish-tomentose cymes. Drupes ovoid-conical, apiculate, supported by persistent, cupular calyx.

Saurashtra, Panchmahals and Chhotaudepur, rare. (GODADIO SAG)

FLS : June-Aug.

Cordia gharaf (Forsk.) Ehrenb. & Asch. in Bitzung. Bericht. Ges. Naturf. Fl. Berlin 46. 1879; S & J 33. *Cornus gharaf* Forsk. Fl. Aegypt.-Arab. 94.1775. *Cordia rothii* R. & S. Syst. Veg. 4:798. 1819; FBI 4:138; C 2:268; WI 2:346.

5-8 m tall trees, with grey or pale-brown, longitudinally fissured bark. Leaves 4-10.5 × 1.2-2.6 cm, oblanceolate-oblong. Flowers white, lax, in terminal and axillary cymes. Drupes 0.6-1 cm long, ovoid-oblong, apiculate, reddish-yellow or orange, mucilagenous.

Throughout in plains; not common. (LIAR GUNDI : NANI GUNDI, NANA GUNDA)

FLS & FRS : Apr.-Jan.

Cordia macleodii Hk. f. & Th. in Journ. Linn. Soc. 2:128. 1858; FBI 4:139; C 2:266; WI 2:346.

9-13 m tall trees, with greyish-brown, rough bark. Leaves 6.5-13.2 × 3.8-11 cm, broadly ovate, glabrous above. Flowers white, in terminal and axillary, tomentose cymes. Drupes not seen.

Dangs (Surkai forests); rare. (DAHIVI)

FLS : May

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Cordia monoica Roxb. Pl. Cor. 1:43. t. 58. 1795; FBI 4:137; C 2:267; S & J 33.

7–9 m tall trees. Leaves 2.5–7.5×1.8–4 cm, ovate or ovate-elliptic. Flowers white, in terminal, tomentose, paniculate cymes.

Saurashtra and Kutch, in hedges, often planted in gardens. (KATHGUNDI, KATHGUNDIJO ZAD, KARPATI GUNDI)

FLS: Aug.–Sep.

Cordia perrottetii Wt. Icon. t. 1381. 1848; FBI 4:138; Saxton & Sedgwick in Rec. bot. Surv. India 6(8):279. 1918; Thaker J. I. Fl. Kutch 174. 1926.

1.5–2.2 m tall trees, with black, smooth bark. Leaves 1.1–2.5×0.8–1.5 cm, elliptic–oblong or obovate-oblong or nearly orbicular. Flowers few, in corymbose cymes. Drupes 1×0.6 cm, ovoid, apiculate, glabrous.

North Gujarat, Saurashtra and Kutch. (JANGLI GUNDI)

FLS : Jan.–May *FRS* : Apr.–May

Cordia wallichii G. Don, Gen. Syst. 4:379. 1837; C 2:266; WI 2:347; S & J 33. *Corɔia obliqua* Willd. var. *wallichii* (G. Don) Cl. in Hk. f. FBI 4:137. 1883.

Trees. Leaves 7.5–16.5×6–16 cm, broadly ovate or ovate-orbicular, glabrous above. Flowers white, in terminal and axillary, paniculate cymes.

Cooke remarks "GUJARAT: Common, Talbot". Recent workers have reported it from Saurashtra and Chhotaudepur; very rare in the latter locality.

FLS : Dec.–Jan.

EHRETIA L.

Key to species

1. Leaves glabrous beneath .. .. *E. laevis*
1. Leaves persistently hairy beneath.. .. .. ..*E. aspera*

Ehretia aspera Roxb. Pl. Cor. 1:41. t. 55. 1795; C 2:270; WI 3:129. *Ehretia obtusifolia* Hochst. ex DC. Prodr. 9:507. 1845; FBI 4:142.

Large shrubs or small trees, upto 5 m tall. Leaves 4–8 × 2.3–4.2 cm, elliptic–oblong or obovate, coriaceous. Flowers white, in terminal and axillary, peniculate cymes. Drupes 0.3–0.5 cm long, dark-brown or nearly black, apiculate, reticulately veined, glabrous, 4-lobed.

Rajpipla, Chhotaudepur, Panchmahals, Saurashtra and Kutch; rather not frequent. (NANI VADHAWRDI, NANDH KAJIYARI)

FLS & FRS : Nov.

Ehretia laevis Roxb. Pl. Cor. 1:42. t. 56. 1795; FBI 1:141; C 2:269; Bor 275; WI 3:129. f. 78; S & J 33.

5–12 m tall trees, with grey or greyish-brown, smooth bark. Leaves 1.5–13.8×1–8 cm, obovate–oblong or elliptic–oblong, coriaceous. glabrous. Flowers white, in terminal and axillary, lax cymes. Drupes 0.4–0.5 cm broad, dark-brown or nearly black, subglobose, reticulately veined, 4–lobed.

At many places except north Gujarat and Dharampur; not common. (DANTRANGO, VADHWARDI, DARAR, VEDHIGALO)

FLS & FRS : Dec.–May

ROTULA Lour.

Rotula aquatica Lour. Fl. Cochinch. 121. 1790; S 164; WI 9:80. *Rhabdia lycioides* Mart. Nov. Gen. & Sp. 2:137. t. 195. 1826; FBI 4:145; C 2:272.

Bushy shrubs, with 25-90 cm long, virgate branches; bark dark-brown, often purple tinged, shallowly fissured. Leaves 0.5–2.2×0.2–0.6 cm, obovate–elliptic or spathulate, glabrous or sparsely hairy. Flowers 0.5–0.6 cm across, pink, solitary or 2–3, in axillary, condensed cymes. Drupes 0.2–0 5 cm across, subglobose, reddish-brown or orange.

Scanned by CamScanner

In central and south Gujarat, in stony river beds, scattered or subgregarious.

FLS & FRS : Oct.–Dec.

SERICOSTOMA Stocks

Sericostoma pauciflorum Stocks in Wt. Icon. t 1377. 1850; FBI 4:175; C 2:288; S & J 33

15–50 cm tall, straggling undershrubs. Leaves 0.6–2.5 × 0.2 0.6 cm, linear-oblong or linear-lanceolate, appressed-hispid. Flowers white, in leaf-opposed, scorpioid racemes. Nutlets 4, small, 0.2–0.3 cm long, ovoid-cuneate, rounded and granular on dorsal face, keeled or angled on ventral face.

North Gujarat, Saurashtra and Kutch, common. (KARVAS)

FLS & FRS : Oct.–Jan.

BORAGINACEAE

Key to genera

1. Prostrate, herbs; leaves impressed between nerves above; flowers pale-yellow, axillary, solitary or uppermost at times in unilateral spikes; styles 2; fruit 4-lobed, or 4, 1-seeded pyrenes.. .. ..*Coldenia*
1. Erect, suberect or diffuse sometimes prostrate herbs or undershrubs; upper surface of leaves not as above; flowers white, blue, pink or violet, if yellow atleast not axillary, solitary; style 1; fruit of 4-nutlets :
   2. Basal leaves opposite, upper ones alternate; flowers leaf-opposed or extra-axillary, solitary or in terminal panicles or racemes due to reduction of leaves bearing axillary flowers; calyx persistent, enlarged in fruit; anthers connate in the form of a cone; connective produced beyond anther, often twisted.. .. ..*Trichodesma*
   2. Leaves alternate (seldom sub-opposite); flowers in terminal unilateral spikes; calyx persistent but not enlarged or scarcely enlarged in fruit; anthers not connate (except in *Heliotropium paniculatum* and *H. marifolium*) :

3. Ovary entire or shallowly lobed; style terminal .. .. *Heliotropium*
3. Ovary deeply lobed; style lateral from ovary-lobes :
   4. Flowers bright-yellow, dimorphous; nutlets not glochidiate but tuberculate .. .. .. *Arnebia*
   4. Flowers blue or bluish-purple, not dimorphous; nutlets glochidiate .. ..*Cynoglossum*

ARNEBIA Forsk.

Arnebia hispidissima DC. Prodr. 10:94. 1846; FBI 4:176; C 2:289.

Suffrutescent annuals or biennials, clothed with spreading, stiff hairs. Leaves alternate, 1.8–5 × 0.2–0.6 cm, linear-oblong, subacute, appressed-scabrid-hairy. Flowers sessile or subsessile.

Palanpure (vide Cooke) and Kutch (Blatter, 1908).

FLS & FRS : Mar.

COLDENIA L.

Coldenia procumbens L. Sp. Pl. 125. 1753; FBI 4:144; C 2:271; WI 2:307; Ch & O 148; S & J 33; S 164.

Prostrate, glaucous-green, villous herbs. Leaves 0.9–1.8 × 0.3–1 cm, obovate-oblong or elliptic-oblong, entire or faintly lobed. Flowers pale-yellow. Fruits 0.3–0.4 cm long, conical, pale-brown, hairy, reticulate.

Throughout in moist ground. (OKHRAD, BASARIO OKHARAD)

FLS & FRS : Nov.–June

CYNOGLOSSUM L.

Cynoglossum meeboldii Brand in Fedde Repert. 14:[illegible]3. 1916 & in Pfreich. 72:134. 1921; S 166. *Cynoglossum canescens* Grah. Cat. 135. 1839 (non Willd.). *Cynoglossum glochidiatum* Dalz. & Gibs. Bombay Fl. 172 1861 (non Wall.). *Cynoglossum denticulatum* DC. var. *zeylanica* Cl. in Hk. f. FBI 4:157. 1883; C 2:284.

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0.8-1.5 m tall, strigosely hairy undershrubs. Leaves radical and cauline, radical ones large, ± 30×25 cm, broadly ovate-oblong, glabrous with peltate discs beneath, cauline ones 2.5-8 × 1-4 cm, ovate-lanceolate, ovate-oblong or elliptic-oblong, strigose-hairy. Flowers pale-blue or purplish-white, in 10-15 cm long, axillary and terminal, simple or once forked, unilateral cymes. Nutlets 0.2-0.3 cm across, ovoid, glochidiate.

Dangs; common at Malegaon-Saputara region, but rare at Subir.

FLS & FRS : Aug.-Dec.

HELIOTROPIUM L.

Key to species

1. Flowers pale-to bright rose or purple; fruit glabrous, mitriform, 4-beaked.. .. .. *H. indicum*
1. Flowers white, seldom yellow; fruit hairy, of 2-4-nutlets, not beaked :
   2. Corolla lobes patent, caudate-acuminate; flowers yellow or greenish-yellow, in 15-30 cm long spikes; plants usually erect.. .. .. *H. subulatum*
   2. Corolla lobes not caudate-acuminate; flowers white, in spikes not longer than 15 cm; mostly prostrate or diffuse herbs, seldom erect or suberect :
      3. Anther free :
         4. Corolla lobes with intermediate teeth; spikes ebracteate.. .. .. *H. ellipticum*
         4. Corolla lobes without intermediate teeth; spikes bracteate :
            5. Prostrate, villous herbs; nutlets enclosed in persistent calyx; calyx lobes not even as long as 1/3 the length of calyx tube; spike villous .. .. *H. supinum*
            5. Plants not as above; nutlets not covered by persistent calyx lobes; spike not villous; calyx lobes mostly connate at base :

6. Stamens inserted above the middle of corolla tube; stigma short, subcapitate..*H. rariflorum*
6. Stamens inserted at or below the middle of corolla tube; stigma elongate, conical above:
   7. Leaves elliptic or obovate, obtuse at apex, lower with long petioles; bracts persistent:
      8. Spikes 15-25 cm long; leaves 2-4 cm long, calyx lobes subequal..*H. calcareum*
      8. Spikes 5-15 cm long; leaves not more than 2 cm long; calyx lobes very unequal .. .. .. *H. ovalifolium*
   7. Leaves lanceolate, sessile; bracts not persistent.. .. .. *H bacciferum*
3. Anthers united by their produced connectives :
   9. Stigmatic ring distinct on style :
      10. Erect undershrubs; spike upto 15 cm long.. .. .. ..*H. paniculatum*
      10. Prostrate or creeping, seldom erect, herbs; spike upto 5 cm long.. .. ..*H. marifolium*
   9. Stigmatic ring not distinct on style.. .. .. *H. strigosum*

Heliotropium bacciferum Forsk. Fl. Aegpt.-Arab. 38. 1775; S & J 33. *Heliotropium tuberculosum* Boiss. Fl. Orient. 4:147. 1879; C 2:278.

Erect, rigid, 15-30 cm tall, scabrid herbs. Leaves 0.6-2× 0.1-0.3 cm, sessile or subsessile, narrowly linear or lanceolate, densely clothed with stiff hairs. Flowers white, 2-ranked, in 0.8-1.2 cm long, unilateral spikes. Nutlets 4, glabrous or softly hairy.

Saurashtra and Kutch

FLS & FRS : Aug.

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Heliotropium calcareum Stocks in Kew Journ. Bot. 4:174. 1852; FBI 4:150; C 2:277.

Erect, softly ash-coloured, pubescent, stout herbs. Leaves 1.2-3.8×0.8-1.8 cm, elliptic or obovate, softly pubescent. Flowers white, 1-ranked, in 15-25 cm long, terminal, unilateral, scorpioid cymes. Nutlets 4, ovoid, closely covered with silvery hairs, not verrucose, slightly margined.

Kutch, from grasses; rare.

FLS & FRS : Aug.

Heliotropium ellipticum Ledeb. in Eichw. Fl. Casp.-Cauc. 6:10. 1830-33. *Heliotropium eichwaldi* Steud. Nomencl. (ed. 2) 1:744. 1840-41 ex DC. Prodr. 9:535. 1845; FBI 4:149; C 2:277; WI 6:30.

30–90 cm tall, erect, softly hairy, stout herbs. Leaves 3–7× 1.3–2.6 cm, elliptic–oblong or obovate, hairy. Flowers white 2-ranked, in 2.5–4.5 cm long, ebracteate, unilateral spikes. Nutlets 4, ellipsoidal, minutely verrucose and finely puberulous.

North Gujarat (Mansa) and Kutch among grasses or a weed in cultivated fields; rare.

FLS & FRS : March–Aug.

Heliotropium indicum L. Sp. Pl. 130. 1753; FBI 4:152; C 2:273; WI 5:29. f. 18; S & J 33; S 164.

Perennial, 30–75 cm tall, erect, hairy herbs. Leaves 2.7–9× 2–6 cm, broadly ovate, hairy, impressed between nerves above. Flowers numerous, sessile, 2-ranked in simple or forked, extra-axillary, ebracteate, 3–22 cm long spikes. Fruit deeply-lobed, each lobe with a bidentate beak, compressed, 4-ribbed, ovoid or conical, separating into 2, 1-seeded pyrenes.

Bulsar, Saurashtra and Kutch; a road side weed; not common; native of America. (HATHI SUNDHA, HATHI SUNDHO).

FLS & FRS : Throughout the year.

Heliotropium marifolium Koen. ex Retz. Obs. Bot. 2:8. 1781; C 2:280; S & J 33. *Heliotropium scabrum* Retz. Obs. Bot. 2:8. 1781; Ch & O 148.

Prostrate or diffuse herbs, with radially spreading, 4–15 cm long, appressed-hairy branches. Leaves 0.3–1.3×0.2–0.4 cm, linear, sessile or subsessile, appressed-hairy. Flowers white, small, in terminal and axillary, 1.5–3 cm long, unilateral spikes. Nutlets 4, subglobose, hairy.

Throughout in plains among grasses and on sands along sea coast; common (ZINKU OKHARAD)

FLS & FRS : Sep-Oct.

Heliotropium ovalifolium Forsk. Fl. Aegpt.—Arab. 38.1775; FBI 4:150; C 2:278; WI 5:30 f. 19; Ch & O 147; S & J 33; S 165.

Prostrate or suberect, densely appressed-white hairy herbs, 10-45 cm tall. Leaves 0.7–2.5×0.3–1.1 cm, ovate-oblong or obovate, appressed-hairy. Flowers white, 2-ranked, approximate, in terminal, 3–12 cm long, once-forked, unilateral spikes. Nutlets 4, brown, subglobose, densely hairy.

Throughout in drying ponds, ditches, cultivated fields etc; common and gregarious.

FLS & FRS : Aug.-Feb.

Heliotropium paniculatum R. Br. Prodr. 494. 1810; FBI 4:151; C 2:279; Thaker J. I. Fl. Kutch 175. 1926; S & J 33.

30–45 cm tall, appressed-hairy herbs. Leaves 0.6–1 cm long, narrowly linear, subsessile, appressed-hairy. Flowers white, sessile, shortly pedicellate, in terminal, 5–15 cm long, unilateral, simple or forked cymes. Fruit globose, of 4, hairy nutlets.

Saurashtra and Kutch, not common. (*ZUMKHADU*)

FLS & FRS : Aug.

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Heliotropium rariflorum Stock in Kew Journ. Bot. 4:174. 1852; FBI 4:152; C 2:276; Jain in Curr. Sci. 29:361–362. 1960.

Rigid, 15–30 cm tall, appressed-hairy undershrubs. Leaves 0.8–2.5×0.1–0.4 cm, linear, appressed-hairy. Flowers white, in terminal spikes. Nutlets 4, scabrid-hairy.

Kutch (Mundra, Narayan Sarovar, Bhadreshwar); not common. (JAKHAU)

FLS & FRS : Aug.

Heliotropium strigosum Willd. Sp. Pl. 1:743. 1798; FBI 4:151; WI 5:30; S & J 33.

Prostrate, scabridly appressed-hairy, much branched herbs. Leaves 1.2–2.5 cm long, linear, acute, sessile. Flowers white. Nutlets 4, minute, glabrous or sparsely hairy.

Reported from Saurashtra.

FLS & FRS : Aug.–Oct.

Heliotropium subulatum Hochst. ex DC. Prodr. 9:528 & 551. 1845; WI 5:31. f. 20. *Heliotropium zeylanicum* Cl. in Hk. f. FBI 4:148. 1883; C 2:274 (non Lam. 1789).

Erect, scabridly hairy annuals, 30–50 cm tall. Leaves 1.5–6.3×0.3–1.5 cm, lanceolate, densely strigose. Flowers sessile, in 25–45 cm long, terminal, scabrid, simple or branched, scorpioid cymes. Nutlets 4, conical, glabrous, brown, minutely tuberculate.

In arid and semiarid regions, a weed in waste places; common; seldom found in dry deciduous forests. (PILO HATHI SUNDHO, PILO HATHI SUNDHIO).

FLS & FRS : Throughout the year.

Heliotropium supinum L. Sp. Pl. 130. 1753; FBI 4:149; C 2:275; Ch & O 147; S & J 33.

Prostrate, softly villous herbs. Leaves 1.5–2.8×0.3–1.4 cm, ovate, ovate-elliptic or obovate, plicate, appressed-hairy. Flowers subsessile, in simple or once forked, villous, 4–8 cm

long, unilateral cymes. Nutlets 2–3 (–4), pale-brown, thinly pubescent or nearly glabrescent, rounded and obscurely tuberculate on back.

Throughout, in drying moist ground along margins of ponds, ditches, cultivated fields etc.; common and gregarious. (GHEDIO OKHARAD)

FLS & FRS : Nov.–June

TRICHODESMA R. Br. nom. cons.

Key to species :

1. Nutlets with or without a faint entire margin; calyx at flowering time cordate, rounded or hastate at base :
   2. Flowers leaf-opposed or extra-axillary, solitary or in terminal racemes; calyx at flowering time cordate or hastate at base :
      3. Basal lobes of calyx involute :
         4. Anthers exerted, connate in the form of a cone; backs of the connectives densely tomentose with short crisped, yellowish-white hairs; connective tips elongate, glabrous spirally contorted .. .. *T. amplexicaule*
         4. Anthers connivent but free, included; backs of connectives densely penicillate with straight, erect, glistening white, opaque hairs, which equal or exceed tips of connectives; connective tips not spirally twisted .. .. *T. sedgwickianum*
      3. Basal lobes of calyx spreading outwards .. *T. indicum*
   2. Flowers in terminal, paniculate cymes; calyx lobes rounded at base .. .. *T. zeylanicum*
1. Nutlets with a raised, white spiny margin on inner edge; calyx at flowering time truncate ... .. *T. africanum*

Trichodesma africanum (L.) R. Br. Prodr. 496. 1810; FBI 4:154; C 2:283; Thaker J. I. Fl. Kutch 176. 1926. *Borago africana* L. Sp. Pl. 197. 1753.

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45-60 cm tall, stout, scabridly hairy herbs, somewhat lignose below. Leaves 4–7×1–3 cm, elliptic–oblong, scabridly hairy; hairs white from tubercled base. Flowers pedicellate, many, in panicles. Nutlets brown, smooth, glabrous, ovate, rounded on dorsal surface.

FLS & FRS : Aug.

Included on the authority of Thaker J. I. from Kutch.

Trichodesma amplexicaule Roth, Nov. Pl. Sp. 104. 1821; FBI 4:153; Ch & O 146. *Trichodesma indicum* (L.) R. Br. var. *amplexicaule* Cooke, Fl. Pres. Bombay 2:215. 1904 & 2:282. 1958 (reprinted).

15–90 cm tall, simple or branched, strigose herbs. Leaves 2.6–13×1.6–5.6 cm, obovate–oblong or elliptic-oblong, sessile, rough. Flowers blue or rosy-purple. Nutlets 0.4–0.5 cm long, conical, greyish–white, smooth on dorsal surface, rugose on ventral.

Throughout. (UNDHAFULI)

FLS & FRS : July–Feb.

Trichodesma indicum (L.) R. Br. Prodr. 496. 1810; FBI 4:153; C 2:281; S & J 33. *Borago indica* L. Sp. Pl. 137. 1753.

For the differences between *T. indicum* (L.) R. Br. and *T. amplexicaule* Roth see the key.

Chhotaudepur and Saurashtra; not common. (UNDHAFULI; AGIYA KHARSAN).

FLS & FRS : July–Feb.

Trichodesma sedgwickianum Banerjee in Bull. bot. Soc. Beng. 16:9–10. 1962; S 165; Shah & Suryanarayana in Bull. bot. Surv. India 11:295. 1969. *Trichodesma amplexicaule* DC. Prodr. 10:172. 1846 (non Roth 1821).

Very similar to *T. amplexicaule* Roth. See the key for differences between *T. sedgwickianum* Banerjee and *T. amplexicaule* Roth.

Dangs and Chhotaudepur; rare.

FLS & FRS : July–Sep.

Trichodesma zeylanicum (Burm. f.) R. Br. Prodr. 496. 1810; FBI 4:154; C 2:282; Ch & O 146; S & J 33. *Borago zeylanica* Burm. f. Fl. Ind. 41. f. 2. 1768.

30–90 cm tall, strigose, erect herbs. Leaves 1.8–5.2×0.7–1.4 cm, oblong-lanceolate, sessile or subsessile, finely appressed-pubescent beneath. Flowers pale-to bright-blue or rose-coloured, axillary, solitary and in terminal panicles. Nutlets 4, 0.4–0.5 cm long, broadly ovoid, subobtuse, faintly margined, ash-coloured, dotted brown on dorsal surface.

Throughout (except Kutch) in plains, in cultivated fields; common.

FLS & FRS : Nov.–Jan.

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CONVOLVULACEAE 86

Key to genera

1. Corolla tube usually uniformly enlarged from base to apex :
   2. Styles 2; plants not twining :
      3. Erect, suffruticose herbs; corolla lobes imbricate; flowers solitary, axillary and in terminal fascicles .... *Cressa*
      3. Prostrate herbs, or if erect undershrubs, plants silvery-white hairy, seldom plants twining; corolla lobes induplicate-contorted; flowers axillary, solitary or 2-3-fascicled or in cymes :
         4. Prostrate herbs, glabrous or patently hairy; flowers axillary, solitary, stalked; capsules 4-valved; styles 2, each once forked; stigma not capitate .. .. *Evolvulus*
         4. Erect herbs; stem and branches clothed with yellowish or silvery-white hairs; flowers axillary, 1-3-fascicled or stalked heads; capsule irregularly dehiscent; styles 2, united at base; stigmas 2, capitate .. .. *Seddera*
   2. Style 1, stigmas 2; plants twining (seldom erect or diffuse e. g. *Convolvulus*) :
      5. Ovary one-loculed; capsule 4-valved, 2-3-seeded; flowers white or yellow, purple at base within .. .. *Hewittia*
      5. Ovary 2(-4)-loculed; capsule 4-8-valved or irregularly dehiscent, sometimes circumscissile :
         6. Flowers pale-to bright-rosy-purple; plants erect or diffuse, seldom twining.. .. .. *Convolvulus*
         6. Flowers white, creamy-white or yellow, rarely blue or bluish-purple; plants usually twining :
            7. Stigma long; capsule 8-valved.. .. *Jacquemontii*
            7. Stigma globose; capsule 4-valved or circumscissile .. .. *Merremia*

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7. Corolla tube not uniformly enlarged from base to apex :
   8. Fruit dehiscent, if indehiscent, then, with thin fragile walls.. .. .. *Ipomoea*
   8. Fruit indehiscent, woody, mealy or fleshy :
      9. Corolla hypocrateriform, white or creamy-white; stigmas elliptic-oblong; fruit woody.. .. .. *Rivea*
      9. Corolla not as above, bright rosy-purple; stigmas globose; fruit mealy or fleshy.. .. .. *Argyreia*

ARGYREIA Lour.

Key to species

1. Leaves glabrous above; plants usually cultivated.. ..*A. nervosa*
1. Leaves appressed-hairy above; plants not cultivated :
   2. Bracts large, foliaceous; corolla more than 4 cm long, hairy outside; ovary 4-celled.. .. .. ..*A. sericea*
   2. Bracts small, not foliaceous; corolla not more than 4 cm long, densely strigosely hairy on bands; ovary 2-celled.. .. ..*A. strigosa*

Arygyreia nervosa (Burm. f.) Boj. Hort. Maurit. 224. 1837; Ch & O 150; S & J 33; S 171. *Convolvulus nervosus* Burm. f. Fl. Ind. 48. t. 20. f. 1. 1768. *Argyreia speciosa* Sw. Hort. Brit. 289. 1827; FBI 4:185; C 2:324; WI 1:116.

Greyish-or whitish-tomentose, stout, woody twiners. Leaves 6-35×5.5-30 cm, broadly ovate, whitish-tomentose beneath. Flowers in axillary, capitate cymes. Berries 1-2 cm across, globose, smooth, glabrous.

Cultivated. (SAMUDRASOK, VARDHARO, SAMADAR SOG).

FLS & FRS : Aug.-Oct.

Argyreia sericea Dalz. in Dalz. & Gibs. Bombay Fl. 169 1861; FBI 4:188; C 2:326; S & J 33; S 172.

Appressed-silky-hairy twiners. Leaves 6.5-18×4.5-13.5 cm, broadly ovate, silky-tomentose beneath. Flowers in axillary,

capitate cymes. Berries 1-1.5 cm across, globose, orange-coloured when ripe, glabrous.

In deciduous forests; not common.

FLS : July-Sep. *FRS* : Aug.-Nov.

Argyreia strigosa (Roth) Roberty in Candollea 14:44. 1952; Santapau & Patel in Trans. Bose. Res. Inst. Calcutta 22:41. 1958. *Ipomoea strigosa* Roth, Nov. Pl. Sp. 113. 1821. *Lettsomia setosa* Roxb. Hort. Beng. 13. 1814 (nomen) & Fl. Ind. 1:490. 1832; FBI 4:194; C 2:330; WI 6:77. *Argyreia setosa* (Roxb.) Choisy in Mem. Soc. Phys. Hist. Nat. Genev. 6:425. 1833.

Stout, twining shrubs, strigosely hairy in younger parts. Leaves 6.5-15×6.3-14.8 cm, broadly ovate, grey-tomentose beneath. Flowers in compact, corymbose cymes. Berries not seen.

Dangs and Chhotaudepur (Ambadungar); rare.

FLS : Sep.-Oct.

CONVOLVULUS L.

Key to species

1. Erect herbs or undershrubs :
   2. Calyx hairy.. .. .. ..*C. rottlerianus* var. *rottlerianus*
   2. Calyx glabrous.. .. ..*C. rottlerianus* var. *tenellus*
1. Prostrate herbs or undershrubs but not twining; if twining leaf-base not hastate or auricled :
   3. Stigma filiform :
      4. Seeds smooth.. .. ..*C. microphyllus*
      4. Seeds tuberculate :
         5. Prostrate herbs.. .. *C. auricomus* var. *auricomus*
         5. Twining herbs.. .. ..*C. auricomus* var. *volubilis*
   3. Stigma clavate or elliptic-oblong.. ..*C. rhyniospermus*
1. Twining herbs; branches twisted.. .. ..*C. arvensis*

Convolvulus arvensis L. Sp. Pl. 153. 1753; FBI 4:219; C 2:303; WI 2:315; S & J 33; S 164.

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Glabrous herbs. Leaves 1.4–3.6×0.2–0.8 cm, ovate-triangular or linear-oblong, glabrous. Flowers axillary, solitary, bright-rosy -purple. Capsule 0.4–0.6 cm long, glabrous, globose. Seeds dark -reddish-brown, subtrigonous, glabrous.

Throughout in plains; common. (KHETRAU PHUDARDI VELDI, NERIVEL)

FLS & FRS : Oct.–Jan.

Convolvulus auricomus (A. Rich.) Bhandari var. **auricomus.** *Convolvulus auricomus* (A. Rich.) Bhandari in Bull. bot. Surv. India 6:327. 1965; S & J 33. *Ipomoea auricoma* A. Rich. Tent. Fl. Abyss. 2:65. 1839–1845. *Convolvulus glomeratus* Choisy ex DC. Prodr. 9:401. 1845; FBI 4:219; C 2:302; WI 2:315.

Prostrate herbs. Leaves 2.5–4×1–1.5 cm, oblong, thinly pubescent. Flowers in axillary, villous heads. Capsule 0.4–0 6 cm across, nearly globose, glabrous, with smooth seeds.

Kutch, Saurashtra and Rajpipla; rare in the last locality. (RUNCHAD VELDI, RUNCHALI VELDI, RUCHAD NERI).

FLS & FRS : Aug.–Oct.

Convolvulus auricomus (A. Rich.) Bhandari var. **volubilis** (Cl.) Santapau in Santapau & Janardhanan in Bull. bot. Surv. Ind. 8 (Supp. 1): 33. 1967. *Convolvulus glomeratus* Choisy ex DC. var. *volubilis* Cl. in Hk. f. FBI 4:219. 1883; C 2:303.

Listed by Cooke (1958) and Santapau & Janardhanan (1967) from Saurashtra.

Convolvulus microphyllus (Roth) Sieb. ex Spr. Syst. 1:611. 1825; FBI 4:218; C 2:301; Ch & O 155; S & J 34. *Ipomoea microphylla* Roth, Nov. Pl. Sp. 112. 1821.

Prostrate or suberect, 15–30 cm long, hairy herbs. Leaves 0.8–2×0.2–0.6 cm, linear-oblong or elliptic-oblong, tomentose. Flowers pale-to bright-rosy, axillary, solitary or in fascicles. Capsule 0.4–0.5 cm across, ellipsoidal, dark-brown, microscopically papillose, glabrous.

Throughout, common. (SHANKHAVLI, MANKHNI, BIRVAL, ACHI SHANKHAVLI, DHOLI SHANKHAVALI).

FLS & FRS : Throughout the year.

Convolvulus rhyniospermus Hochst. ex Choisy in DC. Prodr. 9:405. 1845; FBI 4:218; C 2:302; S & J 34.

15–45 cm tall, pubescent herbs. Leaves 1.5–2.5 cm long, thinly pubescent. Flowers in axillary, pedunculate, villous heads. Capsule 0.4–0 5 cm across, globose, with minutely tuberculate seeds.

Saurashtra.

FLS & FRS : Dec.

Convolvulus rottlerianus Choisy var. **rottlerianus.** *Convolvulus rottlerianus* Choisy in Mem. Soc. Phys. Geneve 6:477. 1834; FBI 4:219; C 2:301; S & J 34.

Erect, 30–60 cm tall, silky-tomentose herbs or undershrubs. Leaves 2–7.5×1–1.5 cm, linear to linear-lanceolate, sessile or subsessile, silky-pubescent. Flowers bright-rosy, axillary, solitary, pedunculate. Capsule subglobose, glabrous, 0.3–0.4 cm across.

Pavagadh; rare. (UBHI SHANKHAVALI; LAMBA PANNI SHANKHAVALI).

FLS & FRS : Sep.

Convolvulus rottlerianus Choisy var. **tenella** Cl. in Hk. f. FBI 4:219. 1883; C 2:301.

Kutch, Chhotaudepur, Broach (near Dehaj); rare.

FLS & FRS : Aug.–Nov.

CRESSA

Cressa cretica L. Sp. Pl. 223. 1753, FBI 4:225; C 2:296; WI 2:367; S & J 34.

Erect, 10–20 cm tall, densely grey-hairy herbs. Leaves 0.4–0.8 cm long, sessile, ovate or elliptic, appressed-hairy. Flowers

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white or pink. Capsule 0.4–0.6 cm long, ovoid, apiculate, hairy near apex.

Throughout; abundant along sea coast. (RUDANTI, PALIO, KHARIYU).

FLS & FRS : Dec.–July.

EVOLVULUS L.

Key to species

1. Erect, suberect or prostrate herbs; flowers blue..*E. alsinoides*
1. Creeping herbs; flowers white .. .. .. *E. nummularius*

Evolvulus alsinoides (L.) L. Sp. Pl. (ed. 2) 392. 1762; FBI 4:220; C 2:297; WI 3:234. f. 152; Ch & O 154; S & J 34; S 168. *Convolvulus alsinoides* L. Sp. Pl. 157. 1753.

Appressed or patently hairy herbs. Leaves 1–2.5×0.2–1 cm, ovate, elliptic or oblong, appressed-hairy. Flowers axillary, solitary, on filiform peduncles. Capsule 0.3–0.4 cm across, glabrous, rounded. Seeds 0.15–0.2 cm long, oblong, smooth, glabrous, dark-brown.

Throughout, among grasses; common. (KALI SHANKHAVALI, ZINI FUDARDI, KARI BUTI, LAGHU KRUSHNA KANTA)

FLS & FRS : Throughout the year.

Evolvulus nummularius (L.) L. Sp. Pl. (ed. 2) 391. 1762; WI 3:234. *Convolvulus nummularius* L. Sp. Pl. 157. 1753.

15–30 cm long, filiform, radially spreading herbs, rooting at nodes. Leaves 0.6–1.2 cm broad, nearly orbicular, glabrous. Flowers 0.6–0.8 cm across, axillary, solitary. Capsule nearly globose, glabrous.

Bulsar and Chhotaudepur; not common.

FLS & FRS : July–Dec.

HEWITTIA W. & A.

Hewittia sublobata (L. f.) O. Ktze. Rev. Gen. Pl. 441. 1891; S & J 34. *Convolvulus sublobatus* L. f. Sp. Pl. 135. 1781. *Hewittia bicolor* W. & A. in Madras Journ. Lit. & Sci. 5:22. 1837; FBI 4:216; C 2:299.

Glabrous or thinly pubescent herbs. Leaves 4–7.5×3–6.5 cm, ovate, deltoid-ovate, entire, seldom lobed, pubescent. Flowers solitary or few, in cymes, axillary. Capsule 0.4–0.6 cm across, subglobose, pubescent. Seeds oblong, black, smooth, glabrous.

Bulsar, Rajpipla, Vallabh Vidyanagar, Mahi ravines, Panchmahals, north Gujarat and Kutch, on hedges; not frequent.

FLS & FRS : Aug.–Dec.

IPOMOEA L.

Key to species and varieties

1. Flowers deep-red or scarlet (if white leaves pinnatisect) :
   2. Leaves pinnatisect.. .. ..*I. quamoclit*
   2. Leaves entire or shallowly 3-lobed .. .. *I. hederifolia*
1. Flowers white or creamy-white, rarely purple within :
   3. Corolla 7–12 cm long .. ..*I. alba*
   3. Corolla not more than 5 cm long :
      4. Outer sepals cordate or basal lobes triangular .. .. *I. sinensis*
      4. Outer sepals not as above :
         5. Leaves very much lobed .. .. .. *I. coptica*
         5. Leaves entire :
            6. Corolla 1.5 cm long, white; fruiting sepals much recurved; capsules hairy.. .. .. *I. eriocarpa*
            6. Corolla more than 2 cm long, creamy-white, often purple based within; fruiting calyx not as above; capsules glabrous .. .. *I. obscura*
1. Flowers purple or rose-coloured, seldom purple or blue at corolla mouth only; if corolla white, leaves deeply or faintly lobed and purple spotted on dorsal surface :

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7. Shrubs or woody twiners .. .. *I. fistulosa*

7. Prostrate or twining herbs :

8. Corolla not more than 2 cm long :

9. Leaves deeply-lobed . .. . *I. pulchella*

9. Leaves entire :

10. Sepals recurved at fruiting time :

11. Capsule hairy ... . *I. eriocarpa*

11. Capsule glabrous ... . *I. sindica*

10. Sepals not as above at fruiting time .. .. *I. triloba*

8. Corolla more than 2 cm long :

12. Corolla tube white but mouth blue or deep purple .. .. *I. nil*

12. Corolla pale- to bright- or deep-purple :

13. Leaves entire (seldom faintly lobed) :

14. Leaves white-tomentose beneath .. .. *I. dichroa*

14. Leaves not as above :

15. Aquatic; stem hollow.. ... *I. aquatica*

15. Plants not as above; stem not hollow :

16. Stem muricate; peduncle much enlarged at fruiting time .. .. *I. muricata*

16. Stem and peduncle not as above:

17. Flowers in subumbellate cymes; corolla upto 5 cm long :

18. Petioles with stipule like leaves in axils .. .. .. *I. sepiaria* var. *stipulacea*

18. Petioles without stipule like leaves in axils.. .. .. *I. sepiaria* var. *sepiaria*

17. Flowers in corymbose, paniculate cymes; corolla more than 5 cm long.. .. .. .. *I. illustris*

13. Leave deeply-lobed :

19. Plants with tuberous roots .. .. .. *I. batatas*

19. Plants not as above :

20. Flowers in capitate head on long, hairy peduncle .. .. *I. pes-tigridis*

20. Flowers not arranged in capitate head :

21. Leaves bilobed .. .. .. *I. pes-caprae*

21. Leaves more than two lobed :

22. Herbaceous, twining; leaves deeply lobed to the base; pseudostipules often present... .. .. *I. cairica*

22. Woody twiners; leaves digitately lobed but not upto the base; pseudostipules absent .. .. .. *I. mauritiana*

1. Flowers yellow, purple at base within .. .. .. *I. dasysperma*

Ipomoea alba L. Sp. Pl. 161. 1753; S & J 34. *Ipomoea bona-nox* L. Sp. Pl. (ed. 2) 228.1762. *Calonyction speciosum* Choisy, Convolv. Orient. in Mem. Soc. Phys. Geneve 6:441. 1834; C 2:322. *Ipomoea bona-nox* L. var. *grandiflora* Cl. in Hk. f. FBI 4:197. 1883. *Calonyction aculeatum* House, Bull. Torr. Bot. Cl. 31:590. 1904; WI 2:17. 1950.

An extensive twiner, somewhat woody, slightly pubescent in younger parts. Leaves 5–17×4.5–13 cm, broadly ovate-triangular, nearly glabrous, petiolate, with deep sinus at base. Cymes axillary and terminal. Capsules 1.2–1.5 cm long, ovoid-oblong, apiculate glabrous.

Saurashtra; cultivated.

FLS & FRS : Apr.–Dec.

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Ipomoea aquatica Forsk. Fl. Aegpt.-Arab. 44. 1775; FBI 4:210; C 2:315; WI 5:237. f. 131; Ch & O 153; S & J 34. *Convolvulus repens* Vahl, Sym. Bot. 1:17. 1790 (non L.).

Perennial, glabrous herbs, rooting at nodes. Leaves 2.2–8.5 × 0.9–4 cm, broadly ovate–triangular, seldom almost linear. Flowers solitary or 3–4 in cymes. Capsule 0.6–0.8 cm long, ovoid, apiculate, glabrous. Seeds microscopically hairy.

Throughout, in moist ground along margins of ponds and ditches or floating; common. (NALI NI BHAJI, NADA NI VEL)

FLS & FRS : Throughtout the year.

Ipomoea batatas (L.) Lam. Tab. Encycl. 1:465. 1791; FBI 4:202; C 2:320; Bailey 819; WI 5:238. f. 132. & Pl. 13 (col.); S 171. *Convolvulus batatas* L. Sp. Pl. 154. 1753.

Creeping herbs. Leaves 3–12 × 1.5–8 cm, broadly ovate to almost orbicular, glabrous. Flowers few to many, in axillary cymes.

Cultivated; seldom an escape : (SHAKKARIYU)

FLS : Aug.–Oct.

Ipomoea cairica (L.) Sw. Hort. Brit. 287. 1827; WI 5:247. f. 133; Ch & O 154; S & J 34; S 171. *Convolvulus cairicus* L. Syst. (ed. 10) 922. 1759. *Ipomoea palmata* Forsk. Fl. Aegpt.-Arab. 43. 1775; FBI 4:214; C 2:319.

Evergreen herbs, with watery juice. Leaves 4.5–6 cm broad, deeply 5–7-lobed, broadly ovate or nearly orbicular, glabrous. Flowers in axillary, subumbellate cymes. Capsule 1–1.2 cm long, ovoid or subglobose, glabrous.

Throughout, ornamental or on hedges as an escape; common.

FLS & FRS : Throughout the year.

Ipomoea coptica (L.) Roth ex R. & S. Syst. Veg. 4:208. 1819; Ch & O 151. *Convolvulus copticus* L. Mant. 2: Append. 559. 1771. *Ipomoea dissecta* Willd. Phytogr. 5. t. 2. f. 3. 1794; FBI 4:200; C:2:318.

Glabrous, slender herbs. Leaves 2.5–6 cm broad, broadly ovate or nearly orbicular, digitately 5–7-lobed, lobes linear–lanceolate. Flowers axillary, solitary. Capsule 0.8–1.2 cm broad, subglobose, glabrous. Seeds hairy.

Pavagadh and north Gujarat; rare on hedges.

FLS & FRS : Aug.–Sep.

Ipomoea dasysperma Jacq. Ecolg. 1:132. t. 89. 1811–1816; FBI 4:215; C 2:321; S & J 34.

Herbaceous twiners, mostly glabrous. Leaves digitately lobed. Capsules globose, apiculate, 4-loculate, 4-seeded.

Listed by Thaker J. I. (1926, p. 185) from Kutch, Santapau & Janardhanan (1967) from Saurashtra and Saxton & Sedgwick (1918) from north Gujarat (Mansar near Kharaghoda). According to Thaker, it is common in Kutch on hedges. (DIPAD VEL)

FLS & FRS : During monsoon.

Ipomoea dichroa (R. & S.) Choisy in DC. Prodr. 9:364. 1845; WI 5:253; S & J 34. *Convolvulus dichroa* R. & S. Syst. Veg. 4:263. 1819. *Convolvulus pilosus* Roxb. Hort. Beng. 14. 1814 (nomen) & Fl. Ind. 1:473. 1824. *Ipomoea pilosa* auct. non Houtt. 1777; FBI 4:213; C 2:313.

Extensive, patently hairy twiners. Leaves 5.5–11 × 4.6–8.6 cm, broadly ovate, entire or shallowly 3-lobed, petiolate. Flowers in axillary, lax, bracteate cymes. Capsule 1–1.3 cm in diam., globose, glabrous. Seeds oblong or subglobose, light-greyish-brown to almost black, covered with long, white hairs.

Throughout, on hedges and low shrubs or trees; common. (SAFED PANVALI FUDERDI)

FLS & FRS : Aug.–Nov.

Ipomoea eriocarpa R. Br. Prodr. 484. 1810; FBI 4:204; C 2:312; WI 5:248. f. 134; Ch & O 153; S & J 34. *Convolvulus hispidus* Vahl, Symb. Bot. 3:29. 1794. *Ipomoea hispida* (Vahl) R. & S. Syst. Veg. 4:238. 1819 (non Zucc. 1809).

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Slender, trailing or twining, appressed hairy herbs. Leaves 1.5–9.5×0.4–6.5 cm, ovate-oblong or ovate-lanceolate, appressed-hairy. Flowers in axillary cymes. Capsule 0.3–0.4 cm long, ovoid or oblong, glabrous. Seeds light-greyish-black or blackish-brown, glabrous, microscopically reticulate.

Throughout, among grasses; common. (BODI FUDARDI)

FLS & FRS : Aug.-Jan.

Ipomoea fistulosa Mart. ex Choisy in DC. Prodr. 9:349 Jan. 1845; WI 5:248; S & J 34. *Ipomoea carnea* auct. non Jacq. 1760; C 2:321.

Straggling shrubs or small trees with milky juice. Leaves 7–16×5–14 cm, broadly ovate or ovate-lanceolate, thinly pubescent beneath. Flowers in terminal, umbellate cymes.

Throughout (except Kutch), planted or naturalized; native of S. America.

FLS : Throughout the year.

Ipomoea hederifolia L. Syst. (ed. 10) 925. 1759; S 169. *Ipomoea coccinea* auct. non L. 1753 *nisi p. p.*; FBI 4:199. *Ipomoea angulata* Lam. Tabl. Encycl. 1:464. 1781. *Quamoclit coccinea* Cooke, Fl. Pres. Bombay 2:261. 1905 & 2:330. 1958 (reprinted); Bailey 822 non Moench. 1795).

Slender herbs. Leaves 2.8–6×2–5.5 cm, ovate, glabrous, entire or trilobed. Flowers in terminal, lax, umbellate cymes. Capsule 0.6-0.8 cm long, ovoid, glabrous. Seeds ellipsoidal, light-black, glabrous, microscopically reticulate.

Throughout on hedges and low shrubs or trees in forests; native of America.

FLS & FRS : Sep.-Jan.

Ipomoea illustris (Cl.) Prain, Bengal Pl. 735. 1903 & 2:546. 1963 (reprinted); S & J 34; S 170. *Ipomoea campanulata* Choisy in Mem. Soc. Phys. Geneve 6:151. 1833; FBI 4:211; C 2:316 (non L. 1753).

Extensive, woody climbers, hairy in younger parts. Leaves 8–25×6.5–16 cm, broadly ovate or subglobose, glabrous or thinly hairy. Flowers 5-6 cm long. Capsule 1.5–1.7 cm across, ovoid or subglobose. Seeds brown, silky-hairy.

Dangs and Saurashtra; rare. (GOGVEL)

FLS : Nov.-Mar. *FRS :* Jan.-July

Ipomoea mauritiana Jacq. Coll. 4:216. 1791 & in Hort. Schoenbr. 2:39. t. 200. 1797; Verdcourt in Fl. Trop. E. Afr. 135. 1963. *Convolvulus paniculatus* L. Sp. Pl. 156. 1753. *Ipomoea paniculata* (L.) R. Br. Prodr. 486. 1810 (non Burm. f. 1768). *Ipomoea digitata* auct. non L. 1759; WI 5:248.

Woody twiners. Leaves shallowly to deeply 5–7-lobed, lobes 2.7–12.2×1.1–4.5 cm, glabrous, elliptic-oblong or obovate-oblong, sessile, acute. Flowers, in axillary, paniculate cymes. Capsule 1–1.2 cm long, ovoid, glabrous, with cottony seeds.

Ornamental; seen as an escape in Vyara forest.

FLS & FRS : July-Oct.

Ipomoea muricata (L.) Jacq. Hort. Schoenb. 3:40. t. 323. 1798; FBI 4:197; S & J 34; S 169. *Convolvulus muricatus* L. Mant. 1:44. 1767. *Calonyction muricatum* G. Don, Gen. Syst. 4:264. 1838; C 2:322; WI 2:17; Bailey 822.

Deciduous, herbaceous twiners. Leaves 3.5–15×3–11 cm, broadly ovate, glabrous. Flowers 1–4, in axillary cymes. Capsule 1.7–2 cm long, ovoid, glabrous, apiculate.

Throughout on hedges; common. (BHAMARDI, GULABI GARIO)

FLS: Aug.-Oct. *FRS*: Sep.-Dec.

Ipomoea nil (L.) Roth, Cat. Bot. 1:36. 1797; WI 5:250. f. 135; Ch & O 152; S & J 34; S 170. *Convolvulus nil* L. Sp. Pl. (ed. 2) 219. 1762. *Ipomoea hederacea* auct. non Jacq.; FBI 4:199; C 2:321.

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Slender, glabrous or hairy twiners. Leaves 2.5–9.5 × 2.3–9.2 cm, broadly ovate, shallowly to deeply 3–5-lobed. Flowers axillary, solitary or a few in cymes. Capsule 0.8–1.4 cm across, globose, glabrous. Seeds black, oblong, smooth, glabrous.

Throughout, on hedges and among grasses; common (KALADANA)

FLS & FRS : Aug.–Feb.

Ipomoea obscura (L.) Ker-Gawl. in Bot. Reg. 3. t. 239. 1817; FBI 5:251; C 2:317; Ch & O 152; S & J 34. *Convolvulus obscurus* L. Sp. Pl. (ed. 2) 220. 1762.

Annual, glabrous or patently long-hairy herbs. Leaves 1.5–4 × 1.8–4.4 cm, broadly ovate or nearly orbicular, glabrous or sparsely hairy. Flowers 1.5–2.3 cm across, axillary, solitary pedunculate. Capsule 0.8–1.2 cm long, ovoid, apiculate, glabrous Seeds deep-brown, oblong, velvety.

Throughout on hedges; common. (VAD FUDARDI)

FLS & FRS : July-Dec.

Ipomoea pes-caprae (L.) Sw. Hort. Sub. Lond. 35. 1818; WI 5:251; S & J 34. *Convolvulus pes-caprae* L. Sp. Pl. 159. 1753. *Ipomoea biloba* Forsk. Fl. Aegpt.-Arab. 44. 1775; FBI 4:212; C 2:317.

Prostrate, glabrous herbs. Leaves 2.5–5.8 × 3–12 cm, fleshy; lobes ovate or orbicular, glabrous. Flowers axillary, solitary. Capsule 1.5–2 cm long, ovoid, slightly apiculate, glabrous, brown; seeds glabrous, hairy.

Throughout along sea coast on hedges; also cultivated. (MARYAD VEL, DARIANI VEL)

FLS & FRS : Throughout the year.

Ipomoea pes-tigridis L. Sp. Pl. 162. 1753; FBI 4:204; C 2:320; WI 5:251. f. 136; Ch & O 152; S & J 34; S 171.

Twining or trailing, densely patently-hairy herbs. Leaves 4–15 cm broad, deeply 5–7-lobed, broadly ovate or orbicular,

appressed-hairy. Flowers 2–2.5 cm long, pale-rosy-purple or seldom almost white. Capsule 0.7–0.8 cm across, papery, subglobose or ovoid, glabrous. Seeds grey-pubescent.

Throughout on hedges, and among grasses in waste lands; common (PHOTIAL, WAGPADI)

FLS : Aug.–Oct. *FRS :* Sep.–Dec.

Ipomoea pulchella Roth, Nov. Pl. Sp. 115. 1821. *Ipomoea gracilis* Prain in Journ. As. Soc. Bengal 63 (2):111. 1874 (non Peter.); Raizada in Ind. For. 93:225–227. 1967.

Slender, herbaceous twiner. Leaves deeply-lobed, lobes obovate-oblanceolate, glabrous. Flowers 1–3, in axilary cymes. Corolla 1.2–1.5 cm long. Capsule 0.8–1 cm across, nearly globose, glabrous. Seeds silky-hairy.

Central Gujarat (Vasad, Karamsad) on hedges; rare.

FLS & FRS : Sep.–Nov.

Ipomoea quamoclit L. Sp. Pl. 159. 1753; FBI 4:199; WI 5:252. f. 137; Ch & O 153; S & J 34. *Quamoclit vulgaris* Choisy in Mem. Soc. Phys. Hist. Nat. Geneve 6:434. 1833; C 2:331.

Slender, herbaceous twiners. Leaves 3–4.5 cm long, deeply pinnatisect, segments narrowly linear or filiform. Flowers axillary, solitary or few in cymes. Capsule 0.6–1 cm long, ovoid or nearly globose, glabrous, brown. Seeds cuneate, black, minutely hairy.

Throughout, an ornamental or escape, on hedges. (KAMINI, KAMLATA)

FLS & FRS : Throughout the year.

Ipomoea sepiaria Koen. ex Roxb. var. **sepiaria**. *Ipomoea sepiaria* Koen. ex Roxb. Hort. Beng. 14.1814 (nomen) & Fl. Ind. 2:90. 1824; FBI 4:209; C 2:315; S & J 34. *Convolvulus maximus* L. f. Suppl. 137. 1781. *Ipomoea maxima* (L. f.) auct. non Don ex Sw. 1830; WI 5:249; Ch & O 151.

Scanned by CamScanner

A slender twiner. Leaves 1.5–9.2 × 2–8 cm, entire or shallowly 3-lobed, broadly ovate, glabrous. Flowers white or rosy-purple. Capsule 0.7–1 cm across, ovoid or nearly globose, brown. Seeds black, oblong, silky-brown hairy.

Throughout on hedges and on shrubs or low trees in forests; not common. (RATI FUDERDI, GUMED VEL)

FLS & FRS : Throughout the year.

Ipomoea sepiaria Koen. ex Roxb. var. **stipulacea** (Sw.) Cl. in Hk. f. FBI 4:209. 1883; C 2:316. *Ipomoea stipulacea* Sw. Hort. Brit. (ed. 2) 372. 1827.

Listed by Cooke (1958) from Baroda. According to him the characters of the variety are "Leaves usually smaller in size, narrower, apiculate, angled or subsagittate at base with acute lobes; petioles with stipule-like leaves in the axils; flowers rather smaller.

Ipomoea sindica Stapf in Kew Bull. 346. 1894; C 2:313; Ch & O 153; S & J 34.

Slender, trailing or twining, hairy herbs. Leaves 2–5.5 × 0.4–3.2 cm, ovate-oblong, appressed-hairy. Flowers pale-purple, in axillary, compact cymes. Capsule 0.5–0.6 cm long, ovoid, apiculate, dark-brown, glabrous.

Throughout among grasses.

FLS & FRS : Aug.–Oct.

Ipomoea sinensis (Desr.) Choisy in Mem. Soc. Phys. Geneve 6:459. 1833; S & J 34. *Convolvulus sinensis* Desr. in Lam. Encycl. 3:482. 1834. *Aniseia calycina* Choisy in Mem. Soc. Phys. Geneve 6:482. 1834. *Ipomoea calycina* (Choisy) Cl. in Hk. f. FBI 4:201. 1883; C 2:311.

Twining, thinly hairy herbs. Leaves 1.6–8.2 × 1.2–4.5 cm, ovate. Flowers 1–3, in axillary cymes. Capsule 0.4–0.6 cm across, globose, glabrous, brown. Seeds oblong, villous.

Throughout on hedges (except Kutch); Common. (DHOLI FUDARDI).

FLS & FRS : Oct.–Dec.

Ipomoea triloba L. Sp. Pl. 161. 1753; Fernandez et al. in Journ. Bombay nat. Hist. Soc. 52:661 1954.

Slender twiners. Leaves 2.5–10 × 1.6–9.5 cm, ovate-triangular, entire or shallowly to deeply lobed, glabrous. Flowers 0.8–2 cm long, pale- to bright-purple, in axillary, umbellate cymes. Capsule globose, glabrous.

Bulsar, Dangs and Vallabh Vidyanagar, on hedges; rare. (NANI FUDARDI)

FLS & FRS : Sep.–Oct.

JACQUEMONTIA Chiosy

Key to species

1. Flowers blue or bluish-purple, in capitate cymes; stem slender, glabrous .. .. *J. pentantha*

1. Flowers white, in umbellate cymes; stem woody at base, pubescent atleast in younger parts .. .. .. *J. paniculata*

Jacquemontia paniculata (Burm. f.) Hall. f. in Engl. Bot. Jahrb. 16:541. 1893 & 18:95. 1894; C 2:303; Ch & O 156; S & J 35. *Ipomoea paniculata* Burm. f. Fl. Ind. 50. t. 21. f. 3. 1768. *Convolvulus parviflorus* Vahl, Symb. Bot. 3:29. 1794; FBI 4:220 (non DC. 1789)

Twiners; bark pale-to reddish-brown. Leaves 1.8–7 × 1–5 cm, ovate, appressed-silky-brown hairy. Flowers in axillary, umbellate cymes. Capsule 0.4–0.5 cm across, globose, glabrous, apiculate, pale-brown. Seeds brown, nearly globose, glabrous.

Bulsar, Rajpipla, Broach, Pavagadh, Mahi ravines and Saurashtra, on hedges; on the whole rare.

FLS & FRS : Oct.–Mar.

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Jacquemontia pentantha (Jacq.) G. Don in Gen. Syst. 4:283. 1837; Ch & O 156. *Convolvulus pentanthus* Jacq. Coll. 4:210. 1790. *Jacquemontia caerulea* non Choisy 1833; Cooke, Fl. Pres. Bombay 2:296. 1905 & 2:304. 1958 (reprinted).

Twiners with weak, pale-bluish-purple or brownish stem. Leaves 1.5–5×0.8–4.3 cm, ovate, glabrous. Flowers 1.5–2 cm across, in axillary and terminal, long pedunculate, capitate cymes. Fruits not seen.

Cultivated as an ornamental; very sparingly an escape.

FLS & FRS : Throughout the year.

MERREMIA Dennst. ex Hall. f.

Key to species

1. Leaves simple, entire (seldom 3-lobed in *M. hederacea*):
   2. Stem winged .. .. *M. turpethum*
   2. Stem not winged :
      3. Leaves broadly ovate or reniform, deeply cordate at base; creeping herbs, rooting at nodes; flowers sessile or shortly petiolate .. .. .. *M. gangetica*
      3. Leaves not as above; prostrate, diffuse or twining herbs; stem not rooting at nodes; flowers distinctly stalked :
         4. Inflorescence racemose or umbellate cyme; seeds hairy; leaf base not auricled or hastate at base .. .. *M. hederacea*
         4. Flowers 1–3 in cymes; seeds glabrous; leaves auricled or hastate at base :
            5. Outer sepal mostly obtuse or emarginate; corolla 1–1.2 cm long; leaves obtuse, truncate or emarginate, rarely 3-toothed at apex; peduncle upto 1.5 cm long.. ..*M. tridentata* subsp. *tridentata*
            5. All sepals acuminate; corolla 1.2–2 cm long; leaves acute at apex; peduncle 1.5–7 cm long.. .. ..*M. tridentata* subsp. *hastata*

1. Leaves simple, 5–7-lobed :
   6. Plants hairy :
      7. Leaf segments elliptic-lanceolate; peduncle softly hairy; pedicel and calyx glabrous; corolla 3–3.5 cm long, white with pale-violet centre within.. ..*M. dissecta*
      7. Leaf segments broadly triangular or lanceolate; peduncle, pedicel and outer sepals hairy; corolla 4–6 cm long, clear yellow.. .. .. *M. vitifolia*
   6. Plants glabrous .. .. *M. rhyncorhiza*
1. Leaves compound :
   8. Leaflet appressed-long hairy; outer sepal hairy; hairs patently spreading, yellowish-brown; peduncle eglandular ... . *M. aegyptia*
   8. Leaflets and outer sepals glabrous; peduncle seldom hairy, glandular at tip .. .. .. *M. quinquefolia*

Merremia aegyptia (L.) Urb. Symb. Antill. 4:505. 1910; WI 6:349; S & J 35. *Ipomoea aegyptia* L. Sp. Pl. 162. 1753. *Ipomoea pentaphylla* Jacq. Coll. 2:297. 1788; FBI 4:202. *Merremia pentaphylla* (Jacq.) Hall. f. in Bot. Jahrb. 16:552. 1893; C 2:308.

Twining, lignose, densely yellowish-brown hairy annuals. Leaflets 5, 2–6.5×1–2.7 cm, sessile, elliptic-lanceolate or obovate-oblong, appressed-hairy. Flowers white or creamy-white, few, in cymes. Capsule ovoid, apiculate, glabrous Seeds orbicular, pale-reddish-brown, glabrous, smooth.

Throughout on hedges. (PANCH PAN NI FUDARDI);
FLS & FRS : Aug.-Jan.

Merremia dissecta (Jacq.) Hall. f. in Engl. Bot. Jahrb. 16:552. 1893; WI 6:347. *Convolvulus dissectus* Jacq. Obs. 2:4. 1767. *Ipomoea sinuata* Ort. Hort. Matr. Dec. 7:84. 1798; FBI 4:214.

Twiners, yellowish-brown-hairy in younger parts. Leaves 4–8 cm broad, deeply lobed, 1.7–3.5×0.4–0.8 cm, glabrous,

Scanned by CamScanner

pinnatifid or toothed. Flowers axillary, solitary. Capsule 0.5–0.6 cm across, rounded, glabrous. Seeds 0.15–0.2 cm long, oblong, glabrous.

North Gujarat (Ahmedabad, Kadi, Himatnagar); on hedges; rare; native of America.

FLS & FRS : Aug.–Oct.

Merremia gangetica (L.) Cufod. in Bull. Jard. Bot. Jahrb. Brux. Suppl. 31:743. 1961; S & J 35. *Convolvulus gangeticus* L. Cent. Pl. 2:9. 1756. *Evolvulus emarginatus* Burm. f. Fl. Ind. 77. t. 30. f. 1. 1768. *Ipomoea reniformis* Choisy in Mem. Soc. Phys. Geneve 6:446. 1833; FBI 4:206. *Merremia emarginata* (Burm. f.) Hall. f. in Bot. Jahrb. 16:552. 1893; C 2:305; WI 6:347; Ch & O 157.

Slender, thinly hairy herbs. Leaves 0.6–3 × 1–3.7 cm, glabrous, petiolate. Flowers yellow, axillary, solitary. Capsule 0.5–0.6 cm across, subglobose, smooth, glabrous. Seeds subtrigonous, glabrous, smooth, brownish-black or chestnut-brown.

Throughout, in drying moist ground. (UNDARDI, UNDARKANI, UNDARI)

FLS & FRS : Aug.–Feb.

Merremia hederacea (Burm. f.) Hall. f. Jahrb. 18:118. 1894; WI 6:349; S & J 35. *Evolvulus hederaceus* Burm. f. Fl. Ind. 77. t. 30. f. 2. 1768. *Ipomoea chryseides* Ker-Gawl. in Bot. Reg. t. 270. 1818; FBI 4:206. *Merremia chryseides* (Ker-Gawl.) Hall. f. in Engl. Bot. Jahrb. 16:552. 1893; FBI 4:206. C 2:307.

Twining, glabrous herbs. Leaves 2–7 × 1.5–6 cm, ovate, glabrous. Flowers yellow, axillary, racemose. Capsule 0.6–0.8 cm across, ovoid, subtetragonous, glabrous. Seeds yellowish-hairy, triangular, rounded on dorsal surface.

Bulsar, Vallabh Vidyanagar and Saurashtra; rare on hedges.

FLS & FRS : Sep.–Oct.

Merremia quinquefolia (L.) Hall. f. in Engl. Bot. Jahrb. 16:552. 1893; Ch & O 157; S & J 35. *Ipomoea quinquefolia* L. Sp. Pl. 162. 1753.

Twining, glabrous, slender annuals. Leaflets 1.5–7 × 1.1–1.8 cm, elliptic-lanceolate. Flowers creamy-white, axillary, solitary. Capsule 0.7–1 cm across, ovoid, glabrous. Seeds oblong, hairy, light-black.

South Gujarat (Dangs, Vyara, Broach-Kabirvad), central Gujarat (Chhotaudepur, Panchmahals, Pavagadh, Baroda), north Gujarat and Saurashtra, on hedges; rare.

FLS & FRS : Oct.–Jan.

Merremia rhyncorhiza (Dalz.) Hall. f. in Bot. Jahrb. 16:552. 1893; FBI 4:214; C 2:307; WI 6:349. *Ipomoea rhyncorhiza* Dalz. in Kew Journ. Bot. 3:179. 1851; FBI 4:214.

Perennial, twining, villous, slender herbs. Leaves 4–8 cm broad, nearly suborbicular, deeply digitately lobed, lobes elliptic-oblong or lanceolate, pinnatifid, nearly glabrous. Flowers yellow. Capsule 1.2–1.5 cm broad, globose, apiculate, glabrous, smooth. Seeds suborbicular, light-black, glabrous, smooth.

Saurashtra, Panchmahals and Rajpipla; rare.

FLS : July-Sep. *FRS :* Aug.–Oct.

Merremia tridentata (L.) Hall. f. subsp. **hastata** (Desr.) Ooststr. in Blumea 3:317. f. 2(O) 1939 & Fl. Males 4:445. f. 27. 1953. *Convolvulus hastatus* Desr. in Lam. Encycl. Meth. 3:542. 1789. *Merremia hastata* Hall. f. Bot. Jahrb. 16:552. 1883.

Listed from Dharampur by Inamdar (1968).

Merremia tridentata (L.) Hall. f. subsp. **tridentata**. *Merremia tridentata* (L.) Hall. f. Bot. Jahrb. 16:552. 1893; C 2:306; WI 6:347; S & J 35. *Convolvulus tridentatus* L. Sp. Pl. 157. 1753. *Ipomoea tridentata* (L.) Roth in R. & S. Arch. Bot. 1(2):38. 1798; FBI 4:205.

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Prostrate, slender herbs. Leaves 1.2–3 × 0.2–0.8 cm, linear, linear–oblong or obovate–oblong, glabrous. Flowers yellow, axillary, solitary or few cymose. Capsule 0.4–0.6 cm across, globose or ovoid, glabrous. Seeds 4, pale–blackish–brown, glabrous, smooth.

Throughout; common. (BHINIGARIO)

FLS & FRS : July–Dec.

Merremia vitifolia (Burm. f.) Hall. f. in Engl. Bot. Jahrb. 16:552. 1893; C 2:307; WI 6:348. f. 127; S & J 35. *Convolvulus vitifolius* Burm. f. Fl. Ind. 45. t. 18. f. 1. 1768. *Ipomoea vitifolia* Bl. Bijdr. 709. 1825; FBI 4:213.

Perennial, patently hairy herbs; hairs pale–yellow. Leaves 5–15 cm broad, membranous, appressed–hairy. Flowers yellow, 1–7, in axillary cymes. Capsule 1.2–1.5 cm across, subglobose. Seeds black, oblong, glabrous.

Bulsar, Dang, Vyara, Chhotaudepur, Saurashtra, Kutch; on hedges or trees and shrubs; not common.

FLS & FRS : Dec.–Jan.

Merremia turpethum (L.) Shah and Bhatt *comb. nov. Convolvulus turpethum* L. Sp. Pl. 155. 1753. *Ipomoea turpethum* (L.) R. Br. Prodr. 485. 1810; FBI 4:212. *Operculina turpethum* Silva–Manso, Enum. Subst. Braz. 16 & 49. 1836; C 2:309; WI 7:96. f. 41; S & J 35.

Twining or in absence of support trailing herbs, with winged and often twisted stems and branches. Leaves 2.5–7 × 1.5–2 cm, ovate–lanceolate, appressed hairy or glabrescent. Flowers creamy–yellow, axillary, solitary or a few in cymes. Capsule 0.8–1 cm across, globose, glabrous. Seeds globose, light black, glabrous, smooth.

Throughout (except Kutch) on hedges and in forest undergrowth. (NASOTAR)

FLS & FRS : Nov.–Jan.

RIVEA Choisy

Rivea hypocrateriformis Choisy in Mem. Soc. Phys. Geneve 6:403. 1833; FBI 4:184; C 2:323; Ch & O 150; S & J 35; WI 9:43.

Extensive, appressed–whitish–tomentose, woody climbers. Leaves 2–11 × 2.5–13 cm, ovate–orbicular, appressedly–silky–hairy beneath. Flowers 1–3(–5), in axillary cymes. Capsule ovoid, apiculate, chestnut–brown, glabrous. Seeds oblong or slightly trigonous, dark–brown, smooth, glabrous.

Throughout, on hedges; common. (FANG)

FLS : June–Sep. *FRS :* Aug.–Feb.

SEDDERA Hochst.

Seddera latifolia Hochst. & Steud. ex Hochst. in Flora 27 : Beibl. 8. t. 5. 1844; S & J 35. *Breweria latifolia* Bth. ex Cl. in Hk. f. FBI 4:224. 1883; C 2:298.

30–45 cm tall, erect undershrubs or shrubs. Leaves 0.6–1 cm long, elliptic–oblong, pubescent. Flowers blue, in upper axils. Capsules 0.4–0.6 cm long, ovoid, hairy at apex. Seeds 2, dark–brown, glabrous.

Saurashtra and Kutch; not common.

FLS & FRS : Aug.–Dec.

CUSCUTACEAE

CUSCUTA L.

Key to species

1. Style 1, short, stout; stigma thick ovoid.. ..*C. reflexa*
1. Styles 2, long, slender; stigma capitate :
   2. Corolla tube without scales.. .. .. ..*C. hyalina*
   2. Corolla tube with fimbriate scales.. .. ..*C. chinensis*

Cuscuta chinensis Lam. Encycl. Meth. 2:229. 1376; FBI 4:226; C 2:293; WI 2:407; S & J 34.

Scanned by CamScanner

Twining herbs, with filiform, glabrous, yellow to yellowish brown stems. Flowers white, solitary or in shortly stalked cymes. Capsule globose, didymous. Seeds 4, glabrous.

Throughout in plains; but not common. (AMARVEL, ANANTVEL)

FLS & FRS : Aug.–Oct.

Cuscuta hyalina Roth, Nov. Pl. Sp 100. 1821; FBI 4:226; C 2:292.

Similar to *C. chinensis* Lam. but differs from it in not having corollary scales.

Kutch and Saurashtra; very rare.

FLS & FRS : Aug.–Sep.

Cuscuta reflexa Roxb. Pl. Cor. 2:3. t. 104. 1819 & Fl. Ind. 1:445. 1832; FBI 4:225; C 2:292; WI 2:403; Ch & Q 207; S & J 34.

Twiners with creamy–yellow or greenish–yellow, glabrous, somewhat thick and fleshy stems. Flowers white or creamy–white, solitary or 2–4 in cymes or short racemes. Capsule globose, circumscissile, glabrous. Seeds black, glabrous.

Throughout, very common. (AMARVEL, ANANTVEL)

FLS & FRS : Nov.–Apr.

SOLANACEAE

Key to genera

1. Fruiting calyx much enlarged, enveloping the berry :
   2. Flowers solitary; corolla broadly campanulate, plicate in bud condition; leaves glabrous or hairy :
      3. Corolla yellow, 0.8–1.5 cm across; fruiting calyx bladdery.. ... .*Physalis*
      3. Corolla blue or with a purple tinge, 2.5–3 cm across; fruiting calyx 5–angled, but not bladdery....*Nicandra*
   2. Flowers in clustered cymes; corolla narrowly campanulate; leaves and stem densely stellate–hairy.. .. *Withania*

1. Fruiting calyx not enlarged :
   4. Fruit a capsule :
      5. Corolla 10–15 cm long, white (seldom purple); corolla lobes plicate; calyx shorter than fruit; capsule tuberculate or spiny.. .. ..*Datura*
      5. Corolla not more than 5 cm long, rose–coloured, rosy–purple, blue or bluish–purple, seldom yellow or white; corolla lobes not plicate; calyx as long as and enclosing the capsule; capsule not tuberculate or spiny :
         6. Flowers terminal, in paniculate cymes; valves of capsule toothed or cleft.. .. ..*Nicotiana*
         6. Flowers axillary, solitary; valves of capsule entire.. .. ..*Petunia*
   4. Fruit a berry :
      7. Anthers longer than filaments, connate in the form of a cone :
         8. Flowers white, bluish–purple or deep–purple, seldom white with purple streaks; anther dehiscence porous or by short slits.. ... .*Solanum*
         8. Flowers yellow; anther dehiscence by longitudinal slits .. .. *Lycopersicon*
      7. Anthers shorter than filaments and free :
         9. Armed .. .. *Lycium*
         9. Unarmed :
            10. Shrubs; corolla tube tubular; fruits globose or ovoid–oblong .. .. *Cestrum*
            10. Herbs; corolla tube rotate; fruits of different shapes .. .. *Capsicum*

CAPSICUM L.

Capsicum annuum L. var. **acuminata** Fingerh. Mon. Gen. Caps. 13. t. 2. f. C. 1832; C 2:347; WI 2:69. t. 4 (col.); S & J 35. *Capsicum frutescens* Roxb. Fl. Ind 1:574. 1832; FBI 4:239 (non L.).

Scanned by CamScanner

Erect, 30-60 cm tall, glabrous herbs. Leaves 1.5–3.4×0.8–1.9 cm, ovate-lanceolate. Flowers white or creamy-white, erect or drooping, axillary or extra-axillary, solitary or in cymes of 2–3. Berries 2–4 cm long, deep-red when ripe. Seeds nearly orbicular; flat, light-brown.

Cultivated throughout, very seldom an escape. (MARCHI)

FLS & FRS : Throughout the year.

CESTRUM L.

Key to species

1. Corolla lobes distinctly reflexed .. .. .. *C. diurnum*
1. Corolla lobes erect or patent but not reflexed.... *C. nocturnum*

Cestrum diurnum L. Sp. Pl. 191. 1753; Bailey 874.

1–1.3 m tall shrubs. Leaves 3.4–5.5×1.3–2.5 cm, elliptic-oblong or elliptic-lanceolate, membranous, thinly hairy beneath. Flowers ivory-white, in 1.5–6 cm long, terminal panicles. Berries deep-purple or nearly black.

Planted in gardens. (DIVASNI JUI, DIN-KA-RAJA).

FLS & FRS : Throughout the year.

Cestrum nocturnum L. Sp. Pl. 191. 1753; Bailey 874; WI 2:125; S & J 35.

1.5–2 m tall shrubs. Leaves 6–15×1.7–5.8 cm, ovate-oblong, ovate-lanceolate or elliptic-oblong, glabrous. Flowers greenish-white or creamy-white, in 5–12.5 cm long panicles. Berries 0.5–1 cm across, white or deep-purple.

Planted; occasionally an escape. (RATNI RANI)

FLS & FRS : Throughout the year.

DATURA L.

Key to species

1. Plants hairy or tomentose; capsule densely weakly spinous .. .. *D. innoxia*

1. Plants glabrous; capsule tuberculate ... .. *D. metel*

Datura innoxia Mill. Grdn. Dict. (ed. 8) no. 5. 1768; WI 3:14; Ch & O 161; S & J 35. *Datura metel* auct. non L.; FBI 4:243; C 2:344; WI 3:15.

80–120 cm tall, tomentose undershrubs. Leaves 3.5–17.5×2.1–11 cm, ovate-elliptic or elliptic-lanceolate, appressed-hairy. Flowers axillary, solitary. Capsule 2.5–5 cm across, tomentose, globose. Seeds kidney-shape, glabrous, pale-to dark-brown or nearly black.

Throughout, scattered or subgregarious; occasional. (DHANTURA, KANTALO DHANTURO, KALO DHANTURO).

FLS & FRS : Throughout the year.

Datura metel L. Sp. Pl. 179. 1753; WI 3:15. ff. 12 & 13; Ch & O 161; S & J 35. *Datura fastuosa* L. Syst. Nat. (ed. 10) 2:932. 1759; FBI 4:242; C 2:343. *Datura fastuosa* L. var. *alba* Cl. in Hk f. FBI 4:243. 1883; C 2:344.

45–90 cm tall, glabrous annuals. Leaves 6–15×5–14 cm, broadly ovate-triangular, entire or shallowly lobate. Flowers white or tinged purple or wholly purple, axillary, solitary. Capsule 2–3.5 cm across, drooping, with stout tubercles. Seeds nearly orbicular, flat, glabrous, smooth. (GANTHOVALO DHANTURO)

Throughout; not common.

FLS & FRS : Throughout the year.

LYCIUM L.

Lycium barbarum L. Sp. Pl. 192. 1753; FBI 4:241; C 2:342; WI 6:186; S & J 35.

Glabrous, 50–200 cm tall shrubs. Leaves 0.9–2.5×0.4–0.8 cm, linear-lanceolate to oblong-lanceolate or spathulate,

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glabrous. Flowers white, solitary or fascicled. Berries 0.3-0.6 cm across, globose, reddish-purple. Seeds discoid or subreniform microscopically pitted, yellow or yellowish-orange.

On muds flats and sandy shores at Dehaj, Cambay, north Gujarat, Saurashtra and Kutch, scattered or subgregarious; not common. (TALETI)

FLS & FRS : Aug.–Feb.

LYCOPERSICON Mill.

Lycopersicon lycopersicum (L.) Karst. ex Farwell, Annual Report Commissioners Parks Boulevards Detroit 11:83. 1900; S & J 35. *Solanum lycopersicum* L. Sp. Pl. 185. 1753. *Lycopersicon esculentum* Mill. Grdn. Dict. (ed 8) no. 2. 1768; FBI 4:237; C 2:345; WI 6:187; Pl. 8 (col.) & f. 67.

Erect or diffuse, 30–60 cm tall, glandular-pubescent herbs. Leaves pinnate, 6-10 cm long, segments 1-4×0.5-1.5 cm, secondarily pinnatifid to pinnatisect, ovate-elliptic or elliptic-oblong. Flowers greenish- to deep-yellow, drooping, in extra-axillary, 2–4 cm long racemes. Berries 2–8 cm across, deep-red to reddish-yellow, smooth, glabrous, ellipsoid or globose. Seeds numerous, nearly spherical, flat, glabrous.

Cultivated; also frequent as an escape. (TAMATA)

FLS & FRS : Throughout the year.

NICANDRA Adans. nom. cons.

Nicandra physalodes (L.) Gaertn. Fruct. 2:237. t. 131. f. 2. 1791; FBI 4:240; C 2:346; Bailey 871; WI 7:19. f. 10. *Atropa physalodes* L. Sp. Pl. 181. 1753.

Erect, glabrous, 60-90 cm tall herbs. Leaves 5-15×2.2-9.2 cm, ovate-oblong or elliptic-oblong, glabrous. Flowers axillary, solitary, pedicellate. Berries 1-1.5 cm across, globose, glabrous. Seeds numerous, minute, flat, suborbicular, brown.

Dangs (Subir and Saputara); rare; native of Peru.

FLS & FRS : Aug.-Oct.

NICOTIANA L.

Key to species

1. Corolla tube linear, pale-pink or blue .. *N. plumbaginifolia*

1. Corolla tube narrow below, ventricose above, bright-rosy-pink or purple .. .. *N. tabacum*

Nicotiana plumbaginifolia Viv. Elench. Pl. Hort. Dinegro. 26. t. 5. 1820; WI 7:25.

Erect, 30-60 cm tall, viscidly-pubescent herbs. Leaves 2-11 ×0.8-4.5 cm, linear to linear-lanceolate, sessile, at length nearly glabrous. Flowers 1.5–2.5 cm long. Capsule 0.6–0.8 cm long, ovate, glabrous, smooth. Seeds minute, reddish-brown, nearly spherical, microscopically rugose.

Dangs, Baroda, Broach, Rajpipla, Panchmahals and Kutch, in river beds; not common; native of Mexico and West Indies. (PARDESHI TAMAKU)

FLS & FRS : Nov.–Jan.

Nicotiana tabacum L Sp Pl. 180. 1753; FBI 4:245; C 2:346; WI 7:25. Pl. 4 (col.) & f. 12; Ch & O 176; S & J 35.

Viscidly-pubescent, erect, 30–60 cm tall herbs. Leaves 9.5 –27×3–8.5 cm, ovate-elliptic or lanceolate, glandular-pubescent. Flowers 3.5–5 cm long, in 10–20 cm long inflorescence. Capsule 0.8–1.8 cm long, ovate, pale-brown, nearly glabrous, reticulate. Seeds reddish-brown or dark-brown, glabrous, microscopically rugose

Cultivated as a cash crop on small or large scales throughout; also an escape. (TAMAKU)

FLS & FRS : Nov.–Feb.

PETUNIA Juss.

Petunia violacea Lindl. Reg. t. 1626; C 2:346; Bailey 879.

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Viscidly-pubescent, 20-30 cm tall herbs. Leaves 1.5-4×0.5-2 cm, ovate, ovate-lanceolate, pubescent. Flowers violet. Capsule 0.8-1 cm long, pale-straw, glabrous, 4-valved. Seeds minute, spherical, glabrous, dark-reddish-brown, rugose.

Ornamental, also an escape; native of southern parts of S. America.

FLS & FRS : Nov.-Mar.

PHYSALIS L.

Key to species

1. Corolla clear yellow, 0.6-0.8×0.4-0.6 cm; anthers yellow.. .. ..*P. minima*

1. Corolla yellow with 5 purple or brown spots at base within; anthers greenish-blue.. .. ..*P. longifolia*

Physalis longifolia Nutt. in Trans. Amer. Phil. Soc. (ser. II) 5:93. 1837; S & J 36; WI 8:40.

90-120 cm tall herbs, appressed-hairy in younger parts. Leaves 2-11.5×1.8-6 cm, ovate or ovate-oblong. Flowers axillary, solitary. Berries subglobose, glabrous, smooth, orange-coloured.

Cambay, Saurashtra and Bulsar, among grasses, rare; native of Tropical America.

FLS & FRS : Aug.-Sep.

Physalis minima L. Sp. Pl. 183. 1753; FBI 4:238; C 2:340; Ch & O 160; S & J 36; WI 8:38.

Diffuse or suberect, glabrous, 15-75 cm tall herbs. Leaves 2-11.5×1.3-5.8 cm, ovate, elliptic or elliptic-oblong, membranous, glabrous. Flowers axillary, solitary. Berries 0.6-1 cm across, orange -coloured. Seeds discoid, glabrous, muriculate.

Throughout; common. (POPTI, PARPOPTI)

FLS & FRS : July-Jan.

SOLANUM L.

Key to species

1. Plants armed :
   2. Diffuse or procumbent herbs.. .. ..*S. surattense*
   2. Erect shrubs or undershrubs :
      3. Leaves more than 6 cm long :
         4. Flowers bisexual; berries 0.8-1.5 cm in diam. .. ..*S. indicum*
         4. Flowers unisexual; berries 1.8-2.5 cm across.. .. ..*S. incanum*
      3. Leaves upto 6 cm long :
         5. Petiole and pedicel prickly.. .. ..*S. trilobatum*
         5. Petiole and pedicel not prickly .. ..*S. albicule*

1. Plants unarmed, if armed, berries deep-purple and more than 2.5 cm in diam. :
   6. Flowers white or very pale-blue; berries less than 2.5 cm across :
      7. Cultivated; stem tuberous; berries ± 2 cm in diam. .. .. *S. tuberosum*
      7. Wild; stem not tuberous; berries 0.4-0.7 cm in diam. .. ..*S. nigrum*
   6. Flowers bright-to dark-purple; berries more than 2.5 cm across.. .. ..*S. melongena*

Solanum albicule Kotschy ex Dunal in DC. Prodr. 13(1): 204. 1852; C 2:338.

Softly tomentose, heavily armed, 25-40 cm tall undershrubs. Leaves 1.8-4×1.5-2.5 cm, ovate-oblong or subpanduriform, entire or slightly lobed, tomentose beneath. Flowers in racemose cymes. Berries 0.4-0.7 cm across, globose, glabrous, yellow. Seeds subreniform, slighty tuberculate, glabrous.

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Listed by Saxton and Sedgwick (1918) from north Gujarat (Kharaghoda).

FLS & FRS : Oct.

Solanum incanum L. Sp. Pl. 188. 1753; C 2:337; Ch & O 159; S & J 36. *Solanum coagulans* Forsk Fl. Aegpt.-Arab. 47.1775; FBI 4:236. *Solanum melongena* L. var. *incanum* (L.) O.Ktze.; WI 9.391.

Erect shrubs, stellately pale-fulvous-hairy, heavily armed, 50–100 cm tall. Leaves 6–10 × 2.5–5.5 cm, ovate-elliptic, stellate-pubescent, sparsely prickly on nerves. Flowers bright-violet-purple, axillary. Berries ovoid or subglobose, yellow.

Rajpipla to Saurashtra; not common, with restricted distribution. (UBHI RINGNI)

FLS & FRS : Oct.-Jan.

Solanum indicum L. Sp. Pl. 187. 1753 *pro max. parte*; FBI 4:234; C 2:336; S & J 36; WI 9:381. f. 117.

Stout, erect, armed, stellately hairy, 60–120 cm tall undershrubs, with pale-brown or deep-purple bark. Leaves 6–16.2 × 1.8–11.5 cm, broadly elliptic or elliptic-oblong, stellately pubescent atleast beneath, prickly on nerves. Flowers drooping, in extra-axillary racemes. Berries globose, orange-coloured, glabrous. Seeds spherical, flat, microscopically pitted.

In all zones, but restricted in distribution; not common. (UBHI RINGNI, VADRINGNI, DORLI)

FLS & FRS : July-Dec

Solanum melongena L. Sp. Pl. 186. 1753; FBI 4:235; C 2:339; Bailey 869; S & J 36; WI 9:383. f. 119.

30–90 cm tall, armed or unarmed, grey-stellate-tomentose shrubs or undershrubs. Leaves 2.5–10 × 1.5–5.4 cm, ovate or ovate-oblong, pinnatifid, stellate-pubescent. Flowers violet, in short, extra-axillary racemes. Berries of different sizes and shapes, bright- to deep-purple, seldom greenish-white. Seeds nearly spherical, flat, pale-yellow or brown, glabrous.

Cultivated throughout at times an escape in waste places. (RINGANA, RINGAN, VAATYAK)

FLS & FRS : Throughout the year.

Solanum nigrum L. Sp. Pl. 186. 1753; FBI 4:229; C 2:332; Bailey 868; S & J 36; WI 9:391. f. 120.

Erect herbs, glabrous of thinly pubescent in younger parts, 25–90 cm tall. Leaves 2–9 × 1–3.5 cm, broadly ovate or ovate-lanceolate, glabrous or thinly hairy beneath. Flowers white, in pendulous, subumbellate cymes. Berries globose, deep-purple or nearly black, seldom red or yellow. Seeds spherical, flat, yellowish-brown, glabrous, microscopically rugose.

Throughout, a weed everywhere; common. (PILUDI)

FLS & FRS : Throughout the year.

Solanum surattense Burm. f. Fl. Ind. 57. 1768 (excl. syn Pluk. et Raj.); Ch & O 159; S & J 36; WI 9:393. f. 121. *Solanum xanthocarpum* Schrad. & Wendl. Sert. 1:8. t 2. 1795; FBI 4:236; C 2:335.

Stellately pubescent herbs. Leaves 2–12 × 1.5–7.4 cm, pinnatifid, stellately pubescent. Flowers light- to deep-purple or gentian-violet, in extra-axillary racemes. Berries 0.9–1.2 cm across, spherical, yellow or orange when ripe. Seeds spherical or subspherical, compressed, yellowish-brown, glabrous, minutely rugose.

Throughout, a weed everywhere; common. (BHORINGNI, BHOYRINGNI)

FLS & FRS : Throughout the year.

Solanum trilobatum L. Sp. Pl. 188. 1753; FBI 4:236; C 2:337; S & J 36; WI 9:395. f. 123.

1–2.5 m tall, trailing, or subscandent armed, nearly glabrous undershrubs. Leaves 2.5–6 × 1.8–4 cm, ovate to ovate-orbicular, sparsely prickly on midrib. Flowers in extra-axillary

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racemes. Berries 0.6–0.8 cm across, deep-red or scarlet, glabrous, globose. Seeds spherical, glabrous, faintly pitted.

Cooke lists it from Gujarat as "Common in hedges" but according to Saxton & Sedgwick (1918) and Santapau & Janardhanan (1967) the specific localities are Ahmedabad and Saurashtra.

FLS & FRS : Dec.–Feb.

Solanum tuberosum L. Sp. Pl. 185. 1753; FBI 4:229; C 2:339; Bailey 863; WI 9:396. ff. 124, 125 & 126.

This is potato plant, cultivated at some places in Saurashtra, Sabarmati river bed in north Gujarat and Kaira district in central Gujarat.

WITHANIA Pauq. nom. cons.

Withania somnifera (L.) Dunal in DC. Prodr. 13(1):453. 1852; FBI 4:239; C 2:341; Ch & O 160; S & J 36. *Physalis somnifera* L. Sp. Pl. 182. 1753.

70–100 cm tall, hoary tomentose undershrubs. Leaves 2–8.5 × 1.5–4.2 cm, ovate, appressed-hairy. Flowers greenish-yellow, sessile or subsessile, axillary. Berries 0.4–0.6 cm across, smooth, stellate-tomentose, red when ripe. Seeds flat, oblong or nearly spherical, rarely subreniform, smooth.

Throughout in plains; common. (GHODASN, GHODAKUN, ASGANDHA, ASHVAGANDHA)

FLS & FRS : Throughout the year.

SCROPHULARIACEAE

Key to genera

1. Leaves heterophyllous, submerged ones pinnatisect, those above water entire.. .. .. *Limnophila*
1. Leaves not heterophyllous :
   2. Leaves alternate.. .. .. *Verbascum*
   2. Leaves all opposite or atleast basal ones opposite :

3. Corolla spurred or subsaccate; capsule porous or irregularly dehiscent :
   4. Corolla spurred; anther cells distinct; capsule porous-dehiscent; seeds minutely echinulate, wingless .. .. *Kickxia*
   4. Corolla subsaccate; anther cells confluent above; capsule irregularly dehiscent; seeds winged or ribbed, but not echinulate.. .. .. *Schweinfurthia*

3. Corolla neither saccate nor spurred; capsule regularly valvular dehiscent :
   5. Plants semi or total parasites :
      6. Leaves much dissected :
         7. Flowers rosy or reddish-violet; capsule ellipsoidal-oblong, beakless, not oblique; seeds oblong-cuneate.. .. *Sopubia*
         7. Flowers white, creamy-white or pale-yellow; capsule ovoid, obliquely beaked; seeds oblong.. .. .. *Ramphicarpa*
      6. Leaves entire, seldom scaly :
         8. Corolla tube reddish-purple; corolla lobes rosy; calyx spathaceous, not prominently veined .. .. *Centranthera*
         8. Corolla wholly white, yellow or purple; calyx not spathaceous, prominently veined:
            9. Corolla tube almost straight; corolla lobes subequal; flowers blue, purple or bluish-purple .. .. *Buchnera*
            9. Corolla tube abruptly curved; corolla lobes unequal, upper lobes smaller than others; corolla white or yellow, if purple, whole plant purple .. *Striga*
   5. Plants not parasitic :
      10. Flowers yellow :

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11. Corolla clearly bilipped, throat and lip with palate.. .. ..*Lindenbergia*

11. Corolla subzygomorphic, without palate.. ..*Mecardonia*

10. Flowers white, greenish-white, rosy-purple, red or blue :

12. Corolla throat and lip with palate :

13. Flowers greenish-white, arranged in a subfalcate raceme; calyx enlarged in fruiting condition..*Mazus*

13. Flowers pale-rosy or pale-violet, axillary, solitary; calyx narrow.. .. .. *Mimulus*

12. Corolla throat and lip without palate :

14. Calyx winged or ribbed .. .. ..*Torenia*

14. Calyx neither winged nor ribbed :

15. Fleshy herbs; leaves fleshy, few, towards base .. ..*Dopatrium*

15. Plants and leaves not fleshy :

16. Perfect stamens 4, if 2, leaves 3-5-nerved from base :

17. Corolla two-lipped :

18. Viscidly pubescent plants; seeds reticulate.. .. ..*Stemodia*

18. Plants not as above; seeds granular, muricate or rugose..*Lindernia*

17. Corolla not two-lipped :

19. Shrubs or undershrubs..*Scoparia*

19. Herbs :

20. Glandular-hairy plants; leaves pinnatifid.. .. *Sutera*

20. Plants glabrous or if hairy, hairs not glandular-hairy; leaves entire.. .. *Bacopa*

16. Perfect stamens 2 :

21. Flowers in racemes; plants erect .. .. *Veronica*

21. Flowers axillary, solitary or few fascicled; plants prostrate :

22. Calyx cylindric, obscurely 5-toothed.. *Peplidium*

22. Calyx campanulate, 3-4-lobed.. .. *Glossostigma*

BACOPA Aubl. nom. cons.

Key to species

1. Leaves obovate-oblong or spathulate; capsule ovoid, apiculate .. .. *B. monnieri*

1. Leaves linear to linear-lanceolate; capsule globose or broadly ovoid .. .. *B. floribunda*

Bacopa floribunda (R. Br.) Wettst. in Engl. & Prantl, Pfam. 4(36) : 76. 1891; S & J 36. *Herpestis floribunda* R. Br. Prodr. 442. 1810; FBI 4:273. *Moniera floribunda* (R. Br.) T. Cooke, Fl. Pres. Bombay 2:286. 1905 & 2:357. 1958 (reprinted).

Slender herbs, 20-30 cm tall. Leaves 2-2.3×0.2-0.4 cm, glabrous, sessile. Flowers 1-3(2), axillary. Capsule 0.4-0.6 cm long, glabrous.

From moist ground in Saurashtra.

FLS & FRS : Dec.-Apr.

Bacopa monnieri (L.) Pennell in Proc. Acad. Nat. Sci. Philad. 98:94. 1946; WI 1:143; Ch & O 166; S & J 36; S 177. *Lysimachia monnieri* L. Cent. Pl. 2:9. 1756. *Herpestis monniera* Bth. Scrop. Ind. 30.1835; FBI 4:272. *Moniera cuneifolia* Michx. Fl. Bor. Amer. 2:22. 1803; C 2:356.

Creeping, fleshy, glabrous herbs, often radially spreading. Leaves 0.5-1.6×0.2-0.6 cm, sessile or subsessile. Flowers pale-blue or bright-purple, seldom white, axillary, solitary. Capsule 0.4-0.6 cm long, glabrous, smooth. Seeds minute, cuneate or ellipsoidal-oblong, striate, brown.

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Throughout in moist places, in small or large patches. (BAM, JALNAVERI)

FLS & FRS : Throughout the year.

BUCHNERA L.

Buchnera hispida Buch.-Ham. in D. Don, Prodr. Fl. Nep. 91. 1825; FBI 4:298; C 2:373.

10-40 cm tall, hispidly-hairy, slender herbs. Leaves 0.6-2.8 ×0.1-1 cm, sessile or subsessile, lower oblong or slightly obovate, upper linear-lanceolate, sparsely hairy. Flowers 0.7-0.8 cm across, in terminal spikes. Capsule 0.4-0.6 cm long, oblong. Seeds cuneate-oblong, minute, glabrous.

Bulsar, Dangs and Chhotaudepur, rare among grasses.

FLS & FRS : Sep.-Oct.

CENTRANTHERA R. Br.

Centranthera indica (L.) Gamble, Fl. Madras 971. 1924 & 2:683. 1957 (reprinted); WI 2:118; S 184. *Rhinanthus indica* L. Sp. Pl. 603. 1753. *Centranthera hispida* auct. non R. Br. 1810; FBI 4:301; C 2:381.

10-30 cm tall, erect, hispid herbs. Leaves 1-3.2×0.2-0.7 cm, upper linear, lower oblong or obovate. Flowers 1.6-2.5 cm long, in sessile, bracteate cymes. Capsule 0.6-1 cm long, ovoid, hairy, rugose. Seeds oblong-cuneate or conical, striate, glabrous.

Sanjan, Bulsar and Dangs, not frequent.

FLS & FRS : Aug.-Nov.

DOPATRIUM Buch.-Ham.

Dopatrium junceum (Roxb.) Buch.-Ham. ex Bth. Scroph. Ind. 31. 1835; FBI 4:274; C 2:363; S & J 36; S 178. *Gratiola juncea* Roxb. Pl. Cor. 2:16. t. 129. 1798.

Simple or sparingly branched, slender, erect, glabrous herbs, 5-40 cm tall. Leaves 0.3-3.7×0.2-1 cm, obovate or

elliptic-oblong, sessile, glabrous. Flowers bluish-purple, axillary, solitary and apparently in terminal racemes. Capsule 0.2-0.3 cm long, glabrous, globose or ellipsoidal, apiculate.

Bulsar, Dangs, Vyara, Chhotaudepur, Panchmahals, north Gujarat (Ahmedabad, Pahada) and Kutch, in moist places; rare.

FLS & FRS : Aug.-Nov.

GLOSSOSTIGMA W. & A. nom. cons.

Glossostigma diandrum (L.) O. Ktze. Rev. Gen. Pl. 461. 1891; S 186. *Limosella diandra* L. Mant. 2:252. 1771. *Glossostigma spathulatum* W. & A. ex Arn. in Nov. Act. Acad. Leop.-Carol. Nat. Curr. 18:335. 1836; FBI 4:288; C 2:371.

Radially spreading herbs. Leaves 0.2-0.7×0.1-0.25 cm, linear-spathulate, glabrous. Flowers minute, white. Capsule minute, oblong, glabrous.

Chhotaudepur, Panchmahals, Vallabh Vidyanagar, and north Gujarat (Talod), in moist ground among grasses and in cultivated fields; rare, in small patches.

FLS & FRS : Sep.-Oct.

KICKXIA Dum.

Key to species

1. Leaves hastate; spur shorter than corolla tube; corolla glabrous .. ..*K. ramossisima*

1. Leaves not hastate; spur longer than corolla tube; corolla hairy.. .. .. *K. incana*

Kickxia incana (Wall.) Pennell, Scrop. West. Himal. 59. 1943; Ch & O 163. *Linaria incana* Wall. Pl. As. Rar. 2:43-44. 1833; FBI 4:252. *Linaria cabulica* Bth in DC. Prodr. 10:270. 1846; C 2:354. *Linaria cabulica* Bth. var. *pubescens* Hk. f. in Hk. f. FBI 4:251. 1883.

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Slender, hairy, 30–45 cm tall herbs. Leaves 0.5–1.2×0.3–0.7 cm, triangular–ovate. Flowers axillary, solitary. Corolla yellow with purple–spotted palate

Pavagadh and Chhotaudepur; rare.

FLS & FRS : Oct.–Dec.

Kickxia ramossisima (Wall.) Janch. in Oest. Bot Zeit. 82:152. 1933; WI 5:318; Ch & O 164; S & J 36. *Linaria ramossisima* Wall. Pl. As. Rar. 2:43. t. 153. 1831; FBI 4:251; C 2:353.

Perennial, slender, glabrous or hairy herbs. Leaves 1.2–4.5 ×0.6–2.5 cm, basal ones ovate–triangular, gradually becoming lanceolate above. Flowers clear yellow, axillary, solitary and in terminal racemes. Capsule 0.4–0.6×0.2–0.4 cm, ovoid or subglobose. Seeds many, minute.

Throughout, on dilapidated walls, river slopes or rock cuttings. (BHINI GHILODI, BHINI CHAT, BHINI VAL, KANOTI).

FLS & FRS : Almost throughout the year.

LIMNOPHILA R. Br. nom. cons.

Limnophila indica (L.) Druce, Rep. Bot. Exch. Cl. Brit. Isles 3:420. 1914; WI 6:116; S 178. *Hottonia indica* L. Syst. Nat. (ed. 10) 919. 1759. *Limnophila gratioloides* R. Br. Prodr. 442. 1810; FBI 4:271; C 2:362.

10–20 cm tall, glabrous annuals. Leaves outside water 1.5–3.5×0.3–1.5 cm, opposite or ternate, narrowly linear–lanceolate or linear–oblong, seldom spathulate, glabrous. Flowers violet purple, axillary, solitary and in terminal racemes. Capsules 0.4–0.6 cm long, 4–5–valved, glabrous, smooth. Seeds minute, oblong or cuneate, rounded at one or both ends, glabrous, smooth. (TARATI, PURTI)

Throughout in water–logged soil or moist ground; common, gregarious.

FLS & FRS : Dec.–Apr.

LINDENBERGIA Lehm.

Lindenbergia muraria (Roxb. ex D. Don) P. Bruehl in Journ. Dept. Sci. Calc. Univ. 2(Bot.) : 27. 1920; S 330. *Stemodia muraria* Roxb. ex D. Don, Prodr. Fl. Nep. 89. 1825. *Dodartia indica* L. Sp. Pl. 633. 1753. *Lindenbergia urticaefolia* Lehm. in Link & Otto, Icon. Pl. Rar. Hort. Berol. 95. t. 31. 1828; FBI 4:262; C 2:379. *Lindenbergia indica* (L.) O. Ktze. Rev. Gen. Pl. 462. 1891; WI 6:116. f 44; Ch & O 165.

Glandular–villous, 15–40 cm long, prostrate or diffuse, seldom erect herbs. Leaves 1.5–7.5×1.7–4.9 cm, opposite or subopposite, ovate, ovate–elliptic or ovate–oblong, glandular–villous. Flowers 0.8–1.2 cm long, axillary, solitary and in terminal, leafy racemes. Capsule 0.2–0.4 cm long, oblong, glabrous. Seeds numerous, oblong, dark–brown, minutely rugose.

Throughout; common on old walls, river slopes and in cultivated fields. (PIRSADEDI, ZAMARVAL, PATHARCHATI, BHINTCHATI)

FLS & FRS : Throughout the year.

LINDERNIA All.

Key to species

1. Capsule narrowly linear to linear–oblong :
   2. Plants diffuse, rooting at lower nodes, somewhat fleshy.. .. ..*L. antipoda*
   2. Plants erect, rarely basal branches diffuse, but without nodal roots, not fleshy :
      3. Leaves sharply serrate; capsule 1.2–1.5 cm long.. .. ..*L. ciliata*
      3. Leaves entire or distantly serrate; capsule 0.3–1 cm long.. .. ..*L. oppositifolius*
1. Capsule ovoid, ellipsoidal or ovoid–oblong :
   4. Leaves 3–5–nerved from base :

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5. Corolla 3–4 times longer than calyx....*L. hyssopioides*

5. Corolla 2–2½ times longer than calyx....*L. parviflora*

4. Leaves one-nerved or penni-nerved :

6. Calyx in bud condition 1/3 or less of its length lobed; flowers violet-purple.. .. .. ..*L. crustacea*

6. Calyx in bud condition 3/4 of its length lobed; flowers white.. .. ..*L. multiflora*

Lindernia antipoda (L.) Alst. in Trim. Handb. Fl. Ceylon 6:214. 1931; S 180. *Ruellia antipoda* L. Sp. Pl. 635. 1753. *Gratiola grandiflora* Retz. Obs. 4:8. 1786. *Bonnaya veronicaefolia* Spr. var. *grandiflora* (Retz.) Hk. f. in Hk. f. FBI 4:285. 1884; C 2:369.

Glabrous herbs. Leaves 0.7–2.5×0.3–0.8 cm, sessile or subsessile, elliptic-oblong or ovate. Flowers 0.8–1.2 cm long, blue, axillary, solitary and in terminal racemes. Capsules 0.8–1.5 cm long, glabrous. Seeds numerous, brown, prominently rugose.

Bulsar, Dangs and north Gujarat, among moist grasses; on the whole rare.

FLS & FRS : Nov.-Dec., seldom upto April

Lindernia ciliata (Colsm.) Pennell in Brittonia 2:182. 1836 & in Journ. Arn. Arb. 24:253. 1943; Ch & O 166; S 180. *Gratiola ciliata* Colsm. Prodr. Descr. Grat. 14. 1793. *Bonnaya brachiata* Link & Otto, Icon. Pl. Select. 2:25. t. 11. 1820; FBI 4:284; C 2:369.

4–20 cm tall, glabrous herbs. Leaves 0.8–4×0.4–1 cm, oblong, elliptic-oblong or obovate, nearly sessile. Flowers bright-rosy-purple, seldom pure white, in terminal and axillary, 3–7 cm long racemes. Capsules 0.6–0.8 cm long, glabrous, smooth. Seeds numerous, minute, black, subquadrate, rugose or minutely muriculate.

Throughout in cultivated fields and among grasses; common.

FLS & FRS : Aug.-Oct.

Lindernia crustacea (L.) F. Muell. Syst. Cens. Austral. Pl. 97. 1882; WI 6:118. f. 45; S & J 36; S 178. *Capraria crustacea* L. Mant. 1:87. 1767. *Vandellia crustacea* Bth. Scrop. Ind. 35. 1835; FBI 4:279; C 2:366.

6–15 cm tall, erect or diffuse, nearly glabrous herbs. Leaves 1–2×0.6–1.6 cm, subsessile, broadly ovate. Flowers bright-bluish-purple, axillary, solitary and in terminal racemes. Capsule 0.4–0.5 cm long, brown, glabrous. Seeds numerous, minute, subquadrate or subglobose, glabrous, rugose.

Throughout (except Kutch), among grasses, in cultivated fields and undergrowth of forests; common.

FLS & FRS : July-Dec.

Lindernia hyssopioides (L.) Haines, Bot. Bihar & Orissa 635. 1922 & 2:266. 1961; S 181. *Gratiola hyssopioides* L. Mant. 174. 1767. *Ilysanthes hyssopioides* Bth. in DC Prodr. 10:419. 1846; FBI 4:283; C 2:368.

This species is listed by Cooke (1958) from Gujarat on the authority of Woodrow, Kanitkar and by Saxton & Sedgwick (1918) from Ahmedabad.

FLS : Oct.-Nov.

Lindernia multiflora (Roxb.) Mukerjee in Journ. Ind. Bot. Soc. 24:131. 1945; S & J 37. *Torenia multiflora* Roxb. Fl. Ind. 3:96. 1832. *Vandellia multiflora* G. Don, Gen. Syst. 4:549. 1838; FBI 4:280.

Annual, erect, glabrous, pale-greenish-yellow herbs. Leaves 1–2.5×0.2–1.2 cm, opposite, sessile or subsessile, obovate-oblong. Flowers white, axillary, solitary or in terminal racemes. Capsules 0.2–0.4 cm long, subglobose, glabrous, apiculate.

Broach, Rajpipla and Saurashtra; rare.

FLS & FRS : Aug.-Sep.

Scanned by CamScanner

Lindernia oppositifolia (Retz.) Mukerjee in Journ. Ind. Bot. Soc. 24:134. 1945; WI 6:118; Ch & O 167. *Gratiola oppositifolia* Retz. Obs. 4:8. 1786. *Bonnaya oppositifolia* Spreng. Syst. Veg. 1:41. 1825; FBI 4:286; C 2:370.

Annual, glabrous, erect or suberect, 15–25 cm tall herbs. Leaves 1.2–3.5×0.3–0.7 cm, linear or narrowly lanceolate. Flowers pale-blue, pink or pinkish-purple, in axillary and terminal, 1.5–7 cm long racemes. Capsule 0.7–1 cm long, brown, linear. Seeds numerous, minute, rugose.

Bulsar, Dangs, Chhotaudepur, Pavagadh, Panchmahals and north Gujarat, among grasses; not common.

FLS & FRS : Sep.-Oct., at times upto March.

Lindernia parviflora (Roxb.) Haines, Bot. Bihar & Orissa 2:635. 1922 & 2:665. 1961 (reprinted); S & J 37. *Gratiola parviflora* Roxb. Pl. Cor. 3:3. t. 203. 1811. *Ilysanthes parviflora* Bth. in DC. Prodr. 10:419. 1846; FBI 4:283; C 2:368.

Annual, erect, glabrous herbs, 8–10 cm tall. Leaves 0.5–4 ×0.3–1.3 cm, ovate-oblong or elliptic-lanceolate, glabrous. Flowers white, axillary, solitary and in terminal racemes. Capsules 0.3–0.5 cm long. glabrous, obtuse or subacute at ends. Seeds minute, pale-brown, oblong or obtusely triangular, muricate.

Throughout, a weed in cultivated fields or drying moist ground; common.

FLS & FRS : Aug.-Feb.

MAZUS Lour.

Mazus pumilus (Burm. f.) Steenis in Nov. Guinea N. Sec. 9:31. 1958. *Lobelia pumila* Burm. f. Fl. Ind. 186. t. 60. f. 3. 1768. *Mazus rugosus* Lour. Fl. Cochinch. 382. 1790. *Lindernia japonica* Thunb. Fl. Jap. 253. 1874. *Mazus japonicus* (Thunb.) O. Ktze. Rev. Gen. Pl. 462. 1891; WI 6:310.

Slender, 10–15 cm tall herbs. Leaves 2-4×0.7–1.7 cm, obovate-spathulate or oblong, glabrous. Racemes axillary and terminal. Capsule 0.4–0.5 cm long, subglobose or subovoid, smooth, glabrous, pale- to dark-brown. Seeds minute, brown, cuneate, rugose.

Rajpipla (Gora), from moist riverbed of Narmada; very rare.

FLS & FRS : Dec.

MECARDONIA Ruiz. & Rav.

Mecardonia procumbens (Mill.) Sm. Fl. S-E U. S. 1065. 1913. *Erinus procumbens* Mill. Grdn. Dict. (ed. 8) no. 6. 1768. *Lindernia dianthera* Sw. Proc. Veg. Ind. Occ. 92. 1788. *Mecardonia dianthera* (Sw.) Pennell in Prodr. Acad. Nat. Sci. Philad. 98:87. 1946.

15–40 cm long, suffruticose, often radially spreading, glabrous herbs. Leaves 0.6–3.1×0.3–2.5 cm, broadly ovate, ovate-oblong or elliptic-oblong. Flowers axillary, solitary. Capsule 0.6–0.8 cm long, oblong, pale-brown, smooth, glabrous. Seeds minute, dark-brown, oblong, obtusely angled, muriculate.

So far found in alluvial beds of river Narmada at Chhotaudepur, Rajpipla and Broach.

FLS & FRS : Oct.–May

MIMULUS L

Mimulus strictus Bth. Scrop. Ind. 28. 1835; WI 6:383. *Mimulus gracilis* auct. non R. Br.; FBI 4:259; C 2:358.

Perennial, prostrate or suberect, 15–45 cm tall, glabrous herbs. Leaves 2.5–7×0.8–2 cm, sessile, linear-oblong or oblong-lanceolate, glabrous, ½-amplexicaul at base. Capsule 0.5–0.7 cm long, obovoid, glabrous. Seeds numerous, ellipsoid-oblong, smooth, glabrous.

Collected by Saxton from Ahmedabad (see Saxton & Sedgwick, 1918).

FLS & FRS : Nov.

Scanned by CamScanner

PEPLIDIUM Del.

Peplidium maritimum (L. f.) Wetstt. in Pfam. 4(3b):78. 1895; S & J 37. *Hedyotis maritima* L. f. Suppl. 119. 1781. *Peplidium humifusum* Del. Descr. Egypt. 148. t. 4. 1812; FBI 4:287; C 2:371.

Annual herbs, glabrous, rooting at nodes. Leaves 0.6–1.5 ×0.4–0.8 cm, subfleshy, obovate-oblong or spathulate. Flowers white, minute, sessile. Capsule 0.2–0.3 cm long, ovoid-oblong, glabrous. Seeds minute, numerous, oblong, glabrous.

Bulsar, north Gujarat (Kharaghoda) and Saurashtra; locally abundant in patches.

FLS & FRS : Aug.–Feb.

RAMPHICARPA Bth.

Ramphicarpa longiflora (Arn.) Bth. in Comp. Bot. Mag. 1:368. 1836 & DC. Prodr. 16:504. 1846; FBI 4:300; C 2:377; S 185. *Buchnera longiflora* Arn. in Nov. Act. Nat. Curr. 18:356. 1836.

10–30 cm tall, annual, glabrous herbs, woody at base. Leaves 1.6–4 cm long, pinnatisect, segments linear or subulate. Flowers 1.5–2 cm long, axillary, solitary. Capsule 0.5–0.8 cm long, black on drying Seeds many, minute, glabrous, pale-brown.

Sanjan, Dharmpur, Bulsar; common among grasses.

FLS & FRS : Aug.–Nov.

SCHWEINFURTHIA A. Braun.

Schweinfurthia sphaerocarpa (Bth.) A. Braun. in Monatsb. Akad. Wiss. Berl. 875. 1866; FBI 4:252; C 1:354; WI 9:255. *Linaria sphaerocarpa* Bth. in DC. Prodr. 10:287. 1846.

Glabrous or nearly so, 15–40 cm tall herbs. Leaves 1.5–2.5 ×0.6–2 cm, elliptic or ovate, sometimes slightly obovate or spathulate. Flowers axillary, solitary, dirty-white, with purple veins. Capsule 0.6–0.8 cm across, nearly orbicular, glabrous. Seeds obconical.

Kutch and Saurashtra; not common. (SANNIPAT, SANIPAT)

FLS & FRS : Dec.

SCOPARIA L.

Scoparia dulcis L. Sp. Pl. 116. 1753; FBI 4:289; C 2:383; WI 9:260.

30–45 cm tall shrubs or undershrubs. Leaves 1–3.5 × 0.4–1.3 cm, broadly elliptic-lanceolate or spathatulate, glabrous. Flowers white, axillary, solitary or few fascicled. Capsule ± 0.2 cm across, subglobose, pale-brown, glabrous, 5-valved. Seeds minute, brown, obovoid, glabrous.

In many parts, a road side weed; common; native of tropical America. (Way of Lahore nr. sachetar metal)

FLS & FRS : Throughout the year.

SOPUBIA Buch.-Ham.

Key to species

1. Leaves pinnatisect, segments filiform; calyx teeth filiform, longer than calyx tube; corolla 2–3 × 1.5–1.8 cm .. .. *S. delphinifolia*

1. Leaves entire or 3-fid, linear; calyx teeth triangular-ovate, as long as calyx tube; corolla 1–1.5 cm long and as much broad .. .. *S. trifida*

Sopubia delphinifolia (L.) G. Don, Gen. Syst. 4:560. 1837; FBI 4:302; C 2:378; Ch & O 168; S & J 37; WI 9:435. *Gerardia delphinifolia* L. Cent. Pl. 2:21. 1756.

Erect, glabrous, suffruticose 25–60 cm tall herbs. Leaves 1.8–4.5 cm long, glabrous. Flowers axillary, solitary and in terminal racemes. Capsule 0.5–0.7 cm long, glabrous, blackish-brown, with furrow on each face. Seeds numerous, many, longitudinally striate.

Throughout among grasses.

FLS & FRS : Aug.–Dec.

Scanned by CamScanner

Sopubia trifida Buch.-Ham. ex D. Don, Prodr. Fl Nep. 88.1825; FBI 4:302; C 2:378.

25–60 cm tall, slender, glabrous herbs. Leaves 1–4 cm long, sessile, upper alternate and entire, lower opposite and 3-fld. Flowers in terminal, bracteate cymes. Capsule 0.3-0.5 cm long, glabrous, notched at apex. Seeds many, minute, longitudinally striate, glabrous.

Dangs (Ahwa and Malegaon-Saputara), in open grassland and cultivated fields; fairly common.

FLS & FRS : Sep.–Oct.

STEMODIA L. nom. cons.

Key to species

1. Flowers pedicellate; corolla twice the length of calyx.. .. .. *S. viscosa*
1. Flowers subpedicellate; corolla almost equal the length of calyx.. .. .. *S. serrata*

Stemodia serrata Bth. in DC. Prodr. 10:381. 1846; FBI 4:265; C 2:359.

Erect, 4-15 cm tall herbs. Leaves 0.7–3×0.3–1 cm, appressed-hairy, narrowly obovate-oblong. Flowers axillary, solitary. Capsule linear-oblong, nearly glabrous. Seeds minute, oblong-ellipsoid.

South Gujarat (Bulsar); rare.

FLS & FRS : Oct.–Nov.

Stemodia viscosa Roxb. Pl Cor. 2:33. t. 163. 1798; FBI 4:265; C 2:359; Ch & O 165; S & J 37.

Diffuse or suberect herbs. Leaves 1.5–5×0.9–1.5 cm, elliptic-oblong or obovate, sessile. Flowers bluish-purple or gentian-violet, rarely pale-rosy-pink or almost white, axillary, solitary and in terminal racemes. Capsules 0.4–0.6 cm long, ovoid-oblong, glabrous, 4-valved. Seeds numerous, oblong, black, glabrous.

Throughout a weed in cultivated fields and drying moist ground, scattered or subgregarious.

FLS & FRS : Oct.–May

STRIGA Lour.

Key to species

1. Plants scabridly hairy; leaves developed; flowers yellow or white but entire plant not violet :
   2. Calyx 4–5-nerved.. .. .. *S. densiflora*
   2. Calyx 10–15-nerved :
      3. Calyx mostly 10-nerved, secondary nerves ending at sinus; flowers sulphur-yellow .. .. .. *S. asiatica*
      3. Calyx mostly 15-nerved, secondary nerves continued up the sides of the adjacent calyx teeth, not ending at sinus . .. . *S. angustifolia*
1. Plants nearly glabrous and wholly violet; leaves scaly; flowers rose-coloured or rosy-purple.. .. .. .. *S. gesneroides*

Striga angustifolia (D. Don) Saldhana in Bull. bot. Surv. India 5:70. 1963; Ch & O 167; S & J 37; S 184. *Buchnera angustifolia* D. Don, Prodr. Fl. Nep. 91. 1825. *Striga euphrasioides* Bth. in Hk. Comp. Bot. Mag. 1:364. 1836; FBI 4:299; C 2:376 (non *Buchnera euphrasioides* Vahl).

10–40 cm tall, erect, slender, scabridly-hairy herbs. Leaves 2–4×0.3–0.4 cm, narrowly linear or linear-lanceolate, sessile. Flowers white, axillary, solitary and in terminal spikes. Capsule 0.5–0.6 cm long, ellipsoid-oblong, smooth, glabrous. Seeds numerous, minute, black, oblong, straight or slightly curved, deeply striate.

Throughout, in grasses; common. (DHOLO AGIO, KUNVARIO AGIO)

FLS & FRS : Aug.–Dec.

Scanned by CamScanner

Striga asiatica (L.) O. Ktze. Rev. Gen. Pl. 2:466. 1891; S 183; Hepper in Rhodora 76:47. 1974. *Buchnera asiatica* L. Sp. Pl. 630. 1753. *Striga lutea* Lour. Fl. Cochin. 22.1790; FBI 4:299; C 2:375; S & J 37

6–20 cm tall, scabrid, erect herbs Leaves 0.9–2 cm long, narrowly linear, sessile. Flowers axillary, solitary and in short, terminal racemes. Capsules 0.4–0.5 cm long, oblong or ellipsoidal. Seeds minute, numerous.

Sanjan, Dharampur, Bulsar, Dangs and Kutch ,not frequent. (PILO AGIO)

FLS & FRS : Aug.–Oct.

Striga densiflora (Bth.) Bth. in Hk. Comp. Bot. Mag. 1:363. 1836; FBI 4:299; C 2:375; S & J 37; S 183. *Buchnera densiflora* Bth. Scroph. India 41. 1835.

15–40 cm tall, scabridly hairy herbs. Leaves 1.2–4×0.15–0.5 cm, narrowly linear, sessile. Capsule 0.3–0.6 cm long, globose or ovoid, glabrous, smooth. Seeds minute, blackish-brown, oblong, reticulate.

Throughout in plains on grasses; not common. (AGIO)

FLS & FRS : Aug.–Dec.

Striga gesneroides (Willd.) Vatke in Oest. Bot. Z. 25:11. 1875; Ch & O 168; S & J 37; S 182. *Buchnera gesneroides* Willd. Sp. Pl. 3:338. 1800. *Buchnera orobanchioides* R. Br. App. Salt. Voy. Abyss. 74. 1814 (nomen) ex Endl. in Bot. Zeit. 2:388. t. 2. 1852. *Striga orobanchioides* (R. Br. ex Endl.) Bth. in Hk. Comp. Bot. Mag. 1:361. t. 19. 1836; FBI 4:299; C 2:374.

30–50 cm tall, glabrous herbs. Leaves 0.5–0.8 cm long, very narrowly linear or subulate. Spikes 8–15 cm long, terminal. Capsule 0.4–0.6 cm long, oblong, dark-brown or nearly black. Seeds minute, numerous, oblong-cuneate, striate.

Throughout; common hosts are *Euphorbia neriifolia* L. & *E. nivulea* Roxb. (RATO AGIO, RATODIO, RATO JOGIDO)

FLS & FRS : Aug.–April

SUTERA Roth

Sutera dissecta (Del.) Walp. Repert. 3:271. 1844; Druce in Kew Bull. 1940: 63–64. *Capraria dissecta* Del. Fl. Egpt. 95. t. 32. f 2. 1812. *Sutera glandulosa* Roth, Nov. Pl. Sp. 291. 1821; FBI 4:258; C 2:356.

Diffuse or suberect herbs. Leaves 0.5–3×0.3–1.1 cm, broadly ovate or elliptic-oblong, lobes toothed. Flowers white, axillary, solitary and in terminal racemes. Capsules 0.2–0.4 cm long, ovoid -oblong or nearly spherical, viscidly-pubescent, at length nearly glabrous. Seeds minute, pale-yellowish-brown, spherical or oblong, glabrous, minutely pitted.

In some parts of south and central Gujarat, in moist ground along ditches, ponds and in river beds; not common.

FLS & FRS : Nov.–Feb.

TORENIA L.

Key to species

1. Wild; calyx winged; filaments of longer stamens not toothed; at base ... . *T. indica*

1. Cultivated, seldom an escape; calyx ribbed but not winged; filaments of longer stamens toothed at base.. .. *T. asiatica*

Torenia asiatica L. Sp. Pl.619. 1753; FBI 4:277; C 2:365; Bailey 897; S 179.

30–40 cm tall, slender, erect, glabrous herbs. Leaves 1–6.5 ×0.8–3.7 cm, ovate-elliptic or elliptic-lanceolate. Flowers axillary, solitary and in very short, terminal racemes, deep-blue, bluish-purple or deep-gentian-blue with yellow centre on lower lip. Capsule 0.6–0.8 cm long, glabrous, ellipsoidal. Seeds numerous, minute, reddish-brown.

Ornamental; seldom an escape.

FLS & FRS : Throughout the year.

Scanned by CamScanner

Torenia indica Saldhana in Bull. bot. Surv. Ind. 8(2):126. t. 1. opp. p. 127. 1966. *Torenia cordifolia* Roxb. Pl. Cor. 2:32. t. 161. 1798; FBI 4:276; C 2:364 (omne nomen misnomer).

8–15 cm tall, simple or branched herbs. Leaves 1.2–3.2 × 0.7–1.6 cm, ovate or ovate–lanceolate, glabrous. Flowers crowded in upper axils, bluish–purple or white. Capsule elliptic–oblong. Seeds numerous, minute.

Bulsar, Dangs and Rajpipla, among grasses; very rare.

FLS & FRS : Aug.–Oct.

VERBASCUM L.

Verbascum chinense (L.) Santapau, Fl. Purandhar 90.1958; Ch & O 163; S & J 37; S 177. *Scrophularia chinensis* L. Mant. 2:250. 1771. *Celsia coromandeliana* Vahl, Symb. Bot. 3:79. 1794; FBI 4:251; C 2:352; WI 2:114.

Annual, erect, glandular–hairy herbs, 20–70 cm tall. Leaves both radical and cauline, radical ones 8–35 cm long, lyrately pinnatifid, cauline ones 1.8–9.7 × 1–3.8 cm, elliptic–oblong, or ovate–oblong, sessile, all appressed–glandular–hairy. Flowers yellow, axillary, solitary and in 10–30 cm long, terminal, simple or branched racemes. Capsules 0.4–0.5 cm across, ovoid or subglobose, pale–brown. Seeds minute, oblong, blackish–brown, rugose.

Throughout, a weed in waste places and cultivated fields; common. (KALHAR, KOLHALA, KUTKI)

FLS & FRS : Throughout the year.

VERONICA L.

Veronica anagallis–aquatica L. Sp. Pl. 12. 1753; FBI 4:293; C 2:373.

Erect, succulent, glabrous herbs, 10–25 cm tall. Leaves 1.5–10 × 0.3–1 cm, linear–oblong or oblong–lanceolate, sessile or subsessile. Flowers white or pale–blue, in 5–10 cm long, axillary

and terminal, bracteate racemes. Capsule 0.2–0.4 cm across, compressed, nearly spherical, glabrous, smooth. Seeds oblong–cuneate, glabrous, smooth.

In moist places at Broach, Rajpipla, Chhotaudepur, Panchmahals, Saurashtra and Kutch; not very common.

FLS & FRS : Nov.–May

OROBANCHACEAE 90

Key to genera

1. Corolla lobes subequal :
   2. Calyx spathaceous; anther cells unequal, upper fertile, lower ones sterile, represented by a clavate or deflexed spur; whole plant reddish–purple; flowers reddish–purple, solitary .. .. *Aeginetia*
   2. Calyx not spathaceous; anther cells parallel and fertile; whole plant yellow, seldom tinged purple; flowers yellow, in a spike .. .. *Cistanche*
1. Corolla 2–lipped, upper lip notched or 2–fid, lower lip 3–lobed .. .. *Orobanche*

AEGINETIA L.

Aeginetia indica L. Sp. Pl. 632. 1753; FBI 4:320; C 2:384; S 186.

Leafless, scapigerous, 15–40 cm tall, erect, rhizomatous herbs. Flowers solitary, at end of stout scape. Corolla reddish–purple, with tube 2–2.5 cm long, curved, inflated. Capsule 1.5–2 cm long, ovoid, beaked, enclosed in persistent calyx and corolla. Seeds numerous, minute, pale–brown, reticulate.

Dharampur and Surat.

FLS & FRS : Sep.–Oct.

CISTANCHE Hoffmugg. & Link

Cistanche tubulosa Wt. Icon. t. 1420. bis. 1850; FBI 4:324; C 2:386; WI 2:185; S & J 37.

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Erect, 15–40 cm tall, scapigerous herbs. Scape stout, fleshy, furrowed, glabrous or pubescent, densely covered with triangular scales. Spikes 10–20 cm long. Capsule 1.5–2.5 cm long, ovoid-oblong, laterally compressed, beaked. Seeds numerous, minute, subglobose, reticulate-punctate.

North Gujarat, Saurashtra and Kutch; a common parasite on roots of *Capparis decidua* Edgew. and *Salvadora persica* L

FLS & FRS : Oct.–Feb

OROBANCHE L.

Key to species

1. Bracteoles 0; stamens inserted about middle of corolla tube; anthers glabrous .. .. *O. cernua* var. *nepalensis*

1. Bracteoles 2; stamens inserted near base of corolla tube; anthers woolly .. .. *O. aegyptiaca*

Orobanche cernua Loefl. var. **nepalensis** DC. Prodr. 11:33. 1847; Ch & O 169. *Orobanche nicotianæ* Wt. Ill. 2:179. t. 158. 1850; FBI 4:326. *Orobanche cernua* Loefl. var. *desertorum* R. Beck. Mon. Orob. in Bibl. Bot. 19:142. t. 33(1). 1890; C 2:387; WI 7:107. f. 47.

10–25 cm tall, scapigerous herbs. Scales 0.5–0.8 cm long, ovate or ovate-lanceolate, acuminate, sessile. Flowers pale-to deep-blue, seldom with a purplish tinge, in compact, bracteate spikes. Corolla 1.8–2 cm long, Capsule 0.8-1 cm long. ellipsoidal-oblong, apiculate, glabrous. Seeds numerous, minute, ovoid, reticulate, brown.

Bulsar, Surat, Pavagadh, Panchmahals, Vallabh Vidyanagar and north Gujarat; a common parasite on roots of solanaceous plants. (VAKUMBHO)

FLS & FRS : Jan.–Mar.

Orobanche aegyptiaca Pers. Syn. 2:181. 1807; C 2:387; S & J 37. *Orobanche indica* Buch.-Ham. in Roxb. Fl. Ind. 3:27. 1832; FBI 4 326.

16-40 cm tall, scapigerous herbs. Scales 0.6–1.6 cm long, lanceolate, glabrous or thinly pubescent. Flowers pale-blue, in 10–15 cm long spike. Capsule 0.5–1 cm long, oblong, glabrous. Seeds minute, subglobose or ovoid, reticulate.

Kutch, Saurashtra, north Gujarat, Chhotaudepur; a common parasite on roots of *Nicotiana, Lycopersicon, Petunia, Brassica oleracea* var. *capitata* and *Cuminum*. (VAKUBMBHO)

FLS & FRS : Jan.–Mar.

LENTIBULARIACEAE

UTRICULARIA L.

Key to species and varieties

1. Aquatic; leaves whorled, pinnatisect, segments filiform, flowers yellow :

   2. Pedicels 0.3–0.5 cm long; peduncle 2.5–15 cm long, above water, with a whorl of spongy floats below inflorescence; seeds not winged .. .. .. *U. inflexa* var. *stellaris*

   2. Pedicels 0.4–0.8 cm long; peduncle 4–8 cm long, without spongy floats; seeds with a broad, corky wing .. .. *U. gibba* var. *exoleta*

1. Terrestrials; leaves not as above and often evanescent; flowers white, purple, blue, bluish-purple or red but never yellow :

   3. Leaves orbicular or reniform; sepals unequal; seeds glochidiate.. .. .. *U. striatula*

   3. Leaves when present usually linear to linear-oblong; seeds reticulate or pitted :

      4. Scape erect; lower lip of corolla 1–1.3 cm broad; spur 0.8–1.3 cm long, curved; seeds pitted; pedicel deflexed in fruit .. .. *U. arcuata*

      4. Scape erect or twining; lower lip of corolla 1.3–1.6 cm broad; spur 0.4–0.8 cm long, nearly straight; pedicel not deflexed in fruiting condition; seeds reticulate :

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5. Scape twining .. .. *U. reticulata*

5. Scape erect.. .. .. *U coerulea*

Utricularia arcuata Wt. Icon. 4:t. 1571. f. 1. 1850; FBI 4:330; C 2:391.

Slender, linear-spathulate, glabrous herbs, with globose bladders. Flowers blue or bluish-purple in racemes. Capsule subglobose, 0.3–0.5 cm across, glabrous. Seeds oblong-ellipsoid.

There is a specimen (WTS 2559) in Gujarat College Herbarium, collected from Ahmedabad by W. T. Saxton; very rare.

FLS & FRS : Oct.

Utricularia coerulea L. Sp. Pl. 18. 1753; FBI 4:331; C 2:392.

Terrestrial herbs, stoloniferous; bladders ovoid. Leaves few, glabrous. Scape 3.5–15 cm long, glabrous. Flowers blue to bluish-purple, mostly crowded at tip of scape.

Listed from Bulsar and its environ from damp places by Patel R. M. (1971).

FLS & FRS : Oct.

Utricularia gibba L. var. **exoleta** (R. Br.) Taylor in Mitt. Bot. Staatss. Munch. 4:101. 1961 & in Kew Bull. 18(1):204. 1964. *Utricularia exoleta* R. Br. Prodr. 430. 1810; FBI 4:329; C 2:390.

This species much resembles *U. inflexa* Forsk. var. *stellaris* (L. f.) Taylor but differs from it in absence of floats and presence of winged seeds.

Dharampur, in a pond.

FLS & FRS : Aug.

Utricularia inflexa Forsk. var. **stellaris** (L. f.) Taylor in Mitt. Bot. Staatss. Munch. 4:96. 1961 & Kew Bull. 18(1):180. 1964; S & J 37. *Utricularia stellaris* L. f. Suppl. 86. 1781; FBI 4:328; C 2:389.

Submerged, rootless herbs, with minute, nearly globose bladders. Racemes 2.5–4 cm long. Floats 3–6, 0.4–0.8 cm long, ovate-oblong or ellipsoidal. Capsule 0.4–0.6 cm across, nearly spherical. Seeds numerous, 4–6-angled.

Throughout in ponds, ditches, puddles etc.

FLS & FRS : Aug.–Dec.

Utricularia reticulata Sm. Exot. Bot. 2:t. 119. 1805; FBI 4:331; C 2:393; S & J 37.

6–20 cm tall, glabrous herbs, almost leafless when flowering. Leaves, when present, 1.2–1.8 cm long, narrowly-oblong, glabrous, with numerous bladders. Scapes flower-bearing for half their length. Flowers bright-pinkish-purple or dark-purple. Capsule 0.4–0.6 cm long, glabrous, ellipsoidal. Seeds ovoid or subrhomboid, reticulate.

Listed from Saurashtra.

FLS & FRS : Oct.

Utricularia striatula Sm. in Rees, Cyclop. 37:n. 17. 1819; C 2:393; S & J 37; S 189. *Utricularia orbiculata* Wall. Cat. no. 1500. 1828 (nomen) ex Oliver in Journ. Linn. Soc. 3:187. 1859; FBI 4:334.

Slender, 4–10 cm tall, stoloniferous herbs. Leaves 0.2–0.3 cm broad, petiolate, in a rosette at base of scapes. Flowers blue or bluish-purple, in 2–7 cm long racemes. Capsule 0.2–0.3 cm in diam., subglobose. Seeds oblong-ellipsoid.

Dangs (on wet rocks at Saputara) and Saurashtra; rare.

GESNERIACEAE

DIDYMOCARPUS Wall. nom. cons.

Didymocarpus pygmaea Cl. in DC. Mon. Phan. 5(1):82. 1883; FBI 4:345; Ch & O 169.

Scanned by CamScanner

A small pubescent herb. Leaves usually one, at times more than two, 0.8–6×0.4–3.5 cm, sessile, pubescent, ovate to ovate-oblong, penni-nerved. Flowers white, few, in axillary cymes but solitary due to reduction. Stamens 2 fertile, 2–3 sterile. Capsule 0.5–1.2 cm long, hairy, linear, loculicidal dehiscent. Seeds numerous, minute, ellipsoidal, dark-brown or blackish-brown, glabrous, faintly reticulate.

Dang, Pavagadh, Devagadh Baria, Chhotaudepur, Panchmahals and north Gujarat (Sarneshwar, Kadi); common on old walls.

FLS & FRS : July–Nov.

BIGNONIACEAE

Key to genera

1. Wild :
   2. Leaves simple .. .. *Tecomella*
   2. Leaves compound :
      3. Leaves 2–3-pinnate :
         4. Corolla tube pink or deep-purple; corolla lobes orange or yellow; capsule flat, smooth; stamens 5 .. .. *Oroxylum*
         4. Corolla white with a pink or yellow tinge; stamens 4; capsule linear-cylindric, irregularly tuberculate .. .. *Radermachera*
      3. Leaves 1-pinnate :
         5. Corolla spathaceous; corolla tube not inflated .. .. *Dolichandrone*
         5. Corolla not spathaceous; corolla tube inflated :
            6. Flowers white or with a rosy tinge; capsule linear, flat .. .. *Heterophragma*
            6. Flowers yellow; capsule cylindric or 4-gonous .. .. *Stereospermum*

1. Planted :
   7. Trees or shrubs :
      8. Leaves 2–3-pinnate :
         9. Flowers blue, 2.5–3.4×1.8–2.5 cm; fruit ellipsoid or nearly orbicular .. .. *Jacaranda*
         9. Flowers creamy-yellow, 5.5–7×1–1.5 cm; fruit linear, flat, acute at both ends .. .. *Millingtonia*
      8. Leaves 1-pinnate :
         10. Calyx spathaceous, leathery; flowers orange-red or scarlet .. .. *Spathodea*
         10. Calyx not spathaceous; flower colour not as above :
            11. Flowers deep-reddish-purple, in pendulous, lax racemes; fruit indehiscent berry .. *Kigelia*
            11. Flowers white with pinkish tinge or yellow or brownish-yellow, in terminal, erect panicles; fruit dehiscent, capsule :
               12. Trees; capsule cylindric, twisted; flowers deep-brownish-yellow .. *Haplophragma*
               12. Shrubs; capsule narrowly linear, flat; flowers pure-yellow .. .. .. *Tecoma*
   7. Plants climbing .. .. *Tecomaria*

DOLICHANDRONE (Fenzl) Seem. nom. cons.

Key to species

1. Leaflets 4.5–13×2.5–6 cm, elliptic-oblong, acuminate, seldom obtuse; capsule slightly compressed, speckled .. *D. atrovirens*
1. Leaflets 2.8–5.3×2–3.3 cm, ovate to ovate-oblong or obovate, obtuse or very shortly acuminate; capsule much compressed, not speckled .. .. *D. falcata* var. *lawii*

Dolichandrone atrovirens (Heyne ex Roth) Sprague in Kew Bull. 1919:307; Patel R. I. For. Fl. Gujarat State 217. 1971. *Bignonia atrovirens* Heyne ex Roth, Nov. Pl. Sp. 284. 1821. *Bignonia crispa* Ham. in Roxb. Fl. Ind. 3:103. 1832. *Dolichandrone crispa* Seem. in Journ. Bot. 8:381. 1870; FBI 4:379; C 2:403.

Scanned by CamScanner

Trees, 10–15 m tall, appressed-pubescent in younger parts. Leaves pinnately compound; leaflets 5–7, glabrous, shortly petiolulate. Flowers few, in terminal racemes. Capsule 30–45 × 1.2–1.5 cm, woody.

The only record of this species for Gujarat is that of Patel R. I., who lists it from south Gujarat. (PADRI, PADAD)

FLS : Mar.–May *FRS :* Cold season

Dolichandrone falcata Seem. var. **lawii** (Seem.) Haines, Bot. Bihar & Orissa 2:658. 1922 & 2:690. 1961 (reprinted); S 191. *Dolichandrone lawii* Seem. in Journ. Bot. 8:381. 1870; FBI 4:380. *Dolichandrone falcata* Sensu Cooke, Fl. Pres. Bombay 2:329. 1904 & 2:404. 1958 (reprinted); WI 3:100 (non Seem. 1870).

A straight or crooked tree, 8–15 m tall, with ash-coloured or light-black bark. Leaves 7–17 cm long; leaflets (–2) 5–9, glabrous. Flowers 4–5 cm long, white, few, in terminal racemes. Pods 20–50 cm long, flat, strongly falcate, dark-black or blackish-brown, glabrous, longitudinally striate. Seeds rectangular, smooth, winged.

Throughout in dry deciduous and scrub forests (except Kutch); not common. (MEDSINGH, MATARSING)

FLS : Apr.–May *FRS :* June–Dec.

HAPLOPHRAGMA P. Dop.

Haplophragma adenophyllum (Wall.) P. Dop. Bull. Soc. Bot. France 72:890. 1925; Maheshwari, Fl. Delhi 259. 1963. *Bignonia adenophyllum* Wall. Cat. 6502. 1832 (nomen) ex Dalz. & Gibs. Bombay Fl. Suppl. 56. 1861. *Heterophragma adenophyllum* Seem. ex Cl. in Hk. f. FBI. 4:381. 1884; C 2:410; WI 5:41. f. 29.

Evergreen trees, 10–15 m tall. Leaves 1-pinnate. Leaflets 3–7, 6–21 × 3–12.8 cm, broadly elliptic, subcoriaceous, glabrous above. Flowers large, woolly-tomentose, in 8–15 cm long panicles. Capsule 30–60 cm long, mostly curved, cylindric, pubescent. Seeds compressed, winged.

Planted in gardens.

FLS & FRS ; Mar.–Apr.

HETEROPHRAGMA DC.

Heterophragma quadriloculare (Roxb.) K. Schum. in Engl. & Prantl, Pfam. 4 (3b):243. 1895; WI 5:42; S & J 37; S 141. *Bignonia quadriloculare* Roxb. Pl. Cor. 2:24. t 145. 1798. *Heterophragma roxburghii* A. DC. Prodr 9:210. 1845; FBI 4:381; C 2:404.

Soft-wooded, 6–15 m tall trees, with greyish-white, scaly bark. Leaves 20–35 cm long; leaflets 4.8–13.5 × 2.5–7.5 cm, sessile or subsessile, subcoriaceous, elliptic-oblong or ovate-elliptic, glabrescent. Flowers 4–5.5 × 3.5–4 cm, in 10–25 cm long, terminal, fulvous-tomentose panicles. Capsule 15.5–30 × 3.5–4.5 cm, glabrous.

Dangs, Vyara and Rajpipla; rare. (WARAS, VADVACHH, PADAR)

FLS : Jan.–Apr. *FRS :* Mar.–Apr.

JACARANDA Juss.

Jacaranda mimosifolia D. Don in Bot. Reg. t. 631. 1822 & Edinb. Phil. Journ. 264. 1823; Steam in Blatt. & Mill. Some Beaut. Ind. Tr. 94. t. 18. 1954. *Jacaranda ovalifolia* R. Br. in Bot. Mag. t. 2327. 1822. *Jacaranda acutifolia* auct. non Hum. & Bonpl.; Bailey 907; WI 5:277. f. 146.

6–15 m tall trees. Leaves 10–30 cm long; pinnae 9–14, 4–8.5 cm long; leaflet 14–24 pairs, 0.5–1.5 × 0.2–0.5 cm, elliptic-oblong or rhomboid-oblong, glabrous. Flowers blue, in 15–25 cm long, terminal, pyramidal panicles.

Planted in gardens, at times along roads; native of Brazil and North-West Argentina.

FLS : Mar.–May

KIGELIA DC.

Kigelia pinnata (Jacq.) DC. Prodr. 9:247. 1845; C 2:411; Bailey 905; WI 5:318. f. 163; S & J 37. *Crescentia pinnata* Jacq. Coll. 3:203. t. 18. 1789.

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An evergreen tree, 8–15 m tall, with soft, smooth, creamy-white or pale-brown bark. Leaves 11–25 cm long, imparipinnate; leaflets 6–9, 5.3–12.5×3.2–6.2 cm, subcoriaceous, elliptic-oblong or obovate-oblong, glabrous or thinly pubescent. Flowers 5.5–7 ×6–7 cm, in long, lax, pendent racemes. Fruit 20–30×8–15 cm, pale-brown.

Planted in gardens and along roads at many places.

FLS : Feb.–Apr. *FRS :* Mar.–June

MILLINGTONIA L. f.

Millingtonia hortensis L. f. Suppl. 291. 1781; FBI 4:377; C 2:409; WI 6:380; S & J 38.

5–10 m tall trees with yellowish-brown, rough, corky bark. Leaves 20–30 cm long; leaflets 2.3–5.5×1.2–2.8 cm, ovate, ovate-rhomboid or ovate-lanceolate, glabrous. Flowers fragrant, pendent, in 10–25 cm long panicles at ends of branches.

Planted in gardens and along roads. (DESHI BUCH)

FLS : Nearly for the whole year.

OROXYLUM Vent.

Oroxylum indicum (L.) Vent. Dec. Gen. Nov. 9. 1808; FBI 4:378; C 1:401; WI 7:107. f. 48; S & J 38; S 190. *Bignonia indica* L. Sp. Pl. 625. 1753.

6–10 m tall, deciduous, soft-wooded trees, with light-brown bark. Leaves 0.9–1.5 m long; leaflets 8–17×4.7–11.2 cm, ovate or ovate-elliptic, glabrous. Flowers 8–9.5×6–8 cm, in 6–10 cm long, compact, terminal racemes. Capsule 45–75×5–10 cm, woody, linear-lanceolate. Seeds numerous, subglobose, winged, broader than long.

In deciduous forests of Dangs, Vyara, Rajpipla, Chhotaudepur and Panchmahals; rare. (TETU, TENTU, ARALU)

FLS : June–Aug. *FRS :* Aug.–Dec.

RADERMACHERA Zoll. & Moritz.

Radermachera xylocarpa (Roxb.) K. Schum. in Engl. & Prantl, Pfam. 4(3b):243. 1895; C 2:407; WI 8:359; S 192. *Bignonia xylocarpa* Roxb. Fl. Ind. 3:108. 1832. *Stereospermum xylocarpum* Bth. & Hk. f. ex Cl. in Hk. f. FBI 4:383. 1885.

15–20 m tall, deciduous trees with light grey-bark. Leaves 70–90 cm long; leaflets 4–7.5×3–5.5 cm, elliptic-oblong, entire, glabrous. Flowers 3.5–5.5 cm long, in terminal panicles. Pods 35–115 cm long, woody, curved, rough, studded with hard irregular tubercles.

Chhotaudepur (Ambadungar, Turkheda and along Kadipani Hampheshwar road) and Dangs; rare.

FLS : Apr.–May *FRS :* Aug.–Mar.

SPATHODEA Beauv.

Spathodea campanulata Beauv. Fl. D' Owar. 1:47. tt. 27–28. 1805; C 2:410; Bailey 907.

Evergreen trees, 10–13 m tall, with greyish-brown, rough bark. Leaves 20–35 cm long; leaflets 11–19, 4.5–12×2.4–7 cm, sessile or subsessile, pubescent beneath. Flowers 7.5–9.5 cm across, in 4.5–10 cm long, compact, terminal racemes.

Planted in gardens and along roads; native of Tropical Africa.

FLS : Feb.–May

STEREOSPERMUM Cham.

Key to species

1. Branches of the panicle slender, glabrous; corolla less than 2.5 cm long, yellow, tinged purple; capsule subquadrangular .. ..*S. personatum*

1. Branches of the panicle viscidly-hairy; corolla dull-purple, 2.5 cm or more long; capsule cylindric.. ..*S. suaveolens*

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Stereospermum personatum (Hassk.) Chatt. Bull. bot. Soc. Bengal 2:70. 1948; S & J 38; S 192. *Dipterosperma personatum* Hassk. in Fl. 25(2): Beibl. 28. 1842. *Stereospermum chelonoides* auct. non DC. 1845; FBI 4:382; C 2:405.

Deciduous, 8–13 m tall trees, with grey or brown, rough bark. Leaves 13–30 cm long; leaflets 5–11, 6–13.5×2–5.2 cm, ovate-elliptic, glabrous, sessile. Panicles 15–30 cm long, terminal. Capsule 20–50 cm long, pale-brown, speckled white or creamy-yellow.

Rajpipla and Saurashtra; rare. (PADAD)

FLS : Mar.-June *FRS :* Nearly throughout the year on trees.

Stereospermum suaveolens (Roxb.) DC. Prodr. 9:211. 1845; FBI 4:382; C 2:406. *Bignonia suaveolens* Roxb. Fl. Ind. 3:104. 1832.

This species is included on the authority of the report of Thaker et al. (1971) from Chhotaudepur forests (Mahudabari in Kawant range).

FLS : Apr.

TECOMA Juss. emend H. B. & K.

Tecoma stans (L.) H. B. & K. Nov. Gen. & Sp. 3:144. 1818; S & J 38. *Bignonia stans* L. Sp. Pl. (ed. 2) 871. 1763. *Stenolobium stans* Seem. in Journ. Bot. 1:88. 1863; C 2:410; Bailey 907.

1.5–4 m tall shrubs. Leaves 7–10 cm long, imparipinnate; leaflets 3–11×2.5–3.5 cm, ovate-lanceolate or ovate-oblong, glabrous. Flowers bright-yellow, in short, racemes. Capsule 10–20 cm long, pale- to dark-brown, beaked.

Planted in gardens.

FLS & FRS : Throughout the year.

TECOMARIA Spach.

Tecomaria capensis (Thunb.) Spach. Hist. Veg Phan. 9:137. 1840; C 2:409; Bailey 908. *Bignonia capensis* Thunb. Prodr. Fl. Cap. 105. 1800. *Tecoma capensis* Lindl. Bot. Reg. t. 117. 1828.

An extensive shrub, climbing by adventitious roots; bark cinnamon-brown, smooth, glabrous. Leaves 6–9 cm long; leaflets 7–9, 1.8–3.5×0.7–2 cm, sessile or subsessile, broadly ovate or lanceolate, glabrous. Flowers 5–6×2–3.5 cm, pale-scarlet, in racemes.

Ornamental, in gardens.

FLS : Aug.–Dec.

TECOMELLA Seem.

Tecomella undulata (Sm.) Seem. in Ann. & Mag. Nat. Hist. (Ser. 3) 10:30. 1862; C 2:402; S & J 38. *Bignonia undulata* Sm. Exot. Bot. 1:35. t. 19. 1805. *Tecoma undulata* G. Don, Gen. Syst. 4:223. 1837; FBI 4:378.

Deciduous shrubs or small trees, 5–7 m tall, with greyish-brown, glabrous bark. Leaves 2.5–7.2×0.5–2.5 cm, narrowly oblong, glabrous. Flowers reddish-yellow or orange-yellow, few, in corymbose racemes. Capsule 20–50 cm long, flat, slightly curved, linear-oblong, glabrous.

Rajpipla, north Gujarat, Saurashtra and Kutch; rare. (RAGAT ROHIDO, ROYDO, ROHIDO)

FLS : Dec.–Apr *FRS ;* Feb.–Apr.

PEDALIACEAE

Key to genera

1. Flowers yellow; fruit 4-spined drupe .. .. *Pedalium*
1. Flowers pink or pale- to bright-purple, seldom white; fruit unarmed capsule .. .. *Sesamum*

PEDALIUM L.

Pedalium murex L. Syst. Nat. (ed. 10) 1123. 1759; FBI 4:386; C 2:412; WI 7:284; S & J 38.

15–40 cm tall, simple or branched, erect or diffuse, pubescent herbs. Leaves 1–6.5×0.7–3.6 cm, fleshy, glabrous, broadly ovate,

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elliptic-oblong or nearly orbicular. Flowers 1.8–3.7 cm long, axillary, solitary Drupes 1.3–1.5 cm across, pyramidal-ovoid, 4-gonous.

On sandy coasts and cultivated fields; common. (UBHU GOKHARU)

FLS & FRS : July–Jan.

SESAMUM L.

Sesamum indicum L. Sp. Pl. 634. 1753; FBI 4:387; C 2:413; Bailey 908; S & J 38; S 193; WI 9:278. ff. 91–93.

60–140 cm tall, glandular-pubescent herbs. Leaves 3.7–23 × 2.3–9 cm, linear-lanceolate or elliptic-lanceolate, entire, lobed or basal ones 3-foliolate, appressed-hairy. Flowers axillary, solitary or 2–3-fascicled, with two, bright-yellow, basal glands. Capsule 1.5–3 × 0.6–0.7 cm, oblong or ovoid, 4-gonous, apiculate. Seeds black, white or brown, glabrous, reticulate.

Throughout, cultivated or an escape in waste places. (TAL)

FLS & FRS : July–Dec.

MARTYNIACEAE 95

MARTYNIA L.

Martynia annua L. Sp. Pl. 613. 1753; WI 6:307. f. 103; S & J 38. *Martynia diandra* Glox. Obs. Bot. 14. t. 1. 1785; FBI 4:386; C 2:414.

45–150 cm tall, viscidly-pubescent herbs. Leaves 2.3–23 × 3.1–21.5 cm, broadly ovate or suborbicular, silky-viscid-pubescent. Flowers pale- to bright-rosy-purple, in 4–12 cm long, pendulous, lax racemes. Drupes 2–3 cm long, pubescent, with a stout, upturned beak; endocarp black, deeply longitudinally ribbed, with two, sharp hooks.

Throughout, a weed in waste places; native of Mexico. (VINCHHUDO)

FLS : July–Oct. *FRS :* July–Dec.

ACANTHACEAE 96

Key to genera

1. Calyx minute, annular or 10–16 toothed; bracteoles large, like spathaceous epicalyx; corolla lobes contorted; ovules two in each loculus of the ovary .. .. *Thunbergia*

1. Calyx distinct, 4–5-fid; bracteoles not as above; ovules more than two in each loculus :
   2. Seeds supported on hard retinacula; ovules superposed in two rows in each loculus of ovary :
      3. Stamens 2; calyx 4-partite :
         4. Bracts rigid; peduncle of spike covered with alternate scales; leaves radical; flowers white .. *Elytraria*
         4. Braets not rigid; spike sessile or if pedunculate, peduncle not as above; leaves cauline; flowers bluish-purple .. .. *Nelsonia*
      3. Stamens 4; calyx 5-partite .. .. .. *Staurogyne*
   2. Seeds not supported on hard retinacula; ovules two in each ovary cell; if ovules more than 2 (seldom more than 8), ovules in one row :
      5. Corolla without an upper lip; lower lip 3-lobed; ovules 2 in each cell .. .. *Blepharis*
      5. Corolla 2-lipped or with 5 subequal lobes :
         6. Corolla lobes twisted in bud :
            7. Ovules more than two in each cell; capsule 6- or more-seeded :
               8. Corolla distinctly 2-lipped :
                  9. Stamens 4; capsule 8–10-seeded. *Hygrophila*
                  9. Stamens 2; capsule 20- or more-seeded.. .. .. *Hemiadelphus*
               8. Corolla of 5 subequal lobes :
                  8. Inflorescence lax, in axillary cymes, sometimes in terminal panicles .. .. .. *Ruellia*

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8.| Inflorescence axillary; flowers solitary or 2-3-together .. .. *Dipteracanthus*

8.| Inflorescence a capituliform compound spike, surrounded by four, large, ovate bracts.. .. .. *Gantelbua*

8.| Inflorescence in short, compact, axillary and/or terminal spikes; bracts of but one kind.. .. .. *Hemigraphis*

7. Ovules 2 in each cell; capsule 4- or less-seeded :

10. Bracts foliaceous, ovate, prominently reticulately veined :

11. Stamens 2 .. .. *Eranthemum*

11. Stamens 4.. .. .. *Petalidium*

10. Bracts not as above :

12. Anthers cells minutely mucronate or spurred at base .. .. *Dyschoriste*

12. Anther cells neither mucronate, nor spurred :

13. Pollen grains round, minutely spiny; spines swollen at base.. .. .. *Thelepaepale*

13. Pollen grains ellipsoidal.. .. .. *Carvia*

6. Corolla lobes imbricate in bud :

14. Ovules 3-10 in each ovary cell; capsule 6-or more-seeded :

15. Flowers in one-sided racemes or terminal panicles.. .. .. *Andrographis*

15. Flowers clustered in midst of axillary cladodes.. .. .. *Haplanthus*

14. Ovules 2, rarely 1 in each ovary cell :

16. Corolla lobes subequal :

17. Anthers 1-celled.. .. .. .. *Crossandra*

17. Anthers 2-celled :

18. Calyx 2-lipped, 5-lobed.. .. *Neuracanthus*

18. Calyx 4-5-lobed but not 2-lipped :

19. Calyx 4-partite, two outer sepals larger than inner; perfect stamens 2.... .. .. *Barleria*

19. Calyx lobes 5, subequal, small; fertile stamens 4 or 2 :

20. Stamens 4; corolla tube inflated above.... *Asystasia*

20. Stamens 2; corolla tube long, slender.. .. .. *Pseuderanthemum*

16. Corolla distinctly 2-lipped :

21. Stamens 4; bracts spinous-tipped.. .. .. *Lepidagathis*

21. Stamens 2; bracts not spinous tipped :

22. Flowers axillary, fascicled or pedunculate cymose.. .. .. *Dicliptera*

22. Flowers in spikes.. .. .. *Rungia*

23. Anther cells (at least the lower) with a white, basal, spur-like appendage :

24. Capsule 4-seeded; seeds rough or tuberculate.. .. .. *Justicia*

24. Capsule 2-seeded; seeds smooth, shining.. .. .. *Monechma*

23. Anther cells not spurred at base.. .. *Adhatoda*

22. Flowers in lax, terminal cymes :

25. Corolla white.. .. .. .. *Rhinacanthus*

25. Corolla rose-coloured or purple.. .. .. *Peristrophe*

ADHATODA Nees

Adhatoda vasica (L.) Nees in Wall. Pl. As. Rar. 3:103. 1832; FBI 4:540; C 2:493; WI 1:31. Pl. 8(1); Ch & O 184. *Justicia adhatoda* L. Sp. Pl. 15. 1753.

0.7-1.2 m tall, evergreen, bushy shrubs. Leaves 4.5-13 × 1.3-5.5 cm, petiolate, elliptic-lanceolate, glabrous. Spikes 2.5-10 cm long. Fruits not seen.

Cultivated in gardens at some places. (ARDUS)

FLS : Dec.-June

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ANDROGRAPHIS Wall.

Key to species

1. Leaves glabrous; inflorescence terminal, laxly paniculate; capsule glabrous.. .. ..*A. paniculata*
1. Leaves hairy; inflorescence axillary racemes; capsule hairy.. .. ..*A. echioides*

Andrographis echioides (L.) Nees in Wall. Pl. As. Rar. 3:117. 1832; FBI 4:505; C 2:451; Ch & O 178; S & J 38. *Justicia echioides* L. Sp. Pl. 16. 1753.

40–60 cm tall, patently hairy annuals. Leaves 3.2–10.5×1.2–5 cm, linear–oblong or elliptic–oblong. Flowers 1–1.2 cm long, creamy- to dirty–white, with purple dots within, in 4–4.5 cm long racemes. Capsule 0.8–1×0.4–0.5 cm, elliptic–lanceolate, pilose. Seeds oblong, pale–blackish–brown, rugose.

Throughout in plains (except Kutch). (KARIYATU)

FLS & FRS : Aug.–Feb.

Andrographis paniculata (Burm. f.) Wall. ex Nees in Wall. Pl. As. Rar. 3:116. 1832; FBI 2:501; C 2:451; WI 1:77. Pl. 14 (2); S & J 38. *Justicia paniculata* Burm. f. Fl. Ind 9. 1768.

An erect, stout, glabrous, 60–90 cm tall herb or under–shrub. Leaves 2.2–10×1.5–2.3 cm, elliptic–lanceolate. Flowers dirty–white or creamy–white, with light–purple or pink streaks within. Capsule 0.8–2 cm long.

Saurashtra (Barda hills) and Kutch, in gardens or as an escape. (KALA–METHI, KARIYATU, LILU KARIATU)

FLS & FRS : Aug.–Oct.

ASYSTASIA L.

Key to species

1. Branches and leaves grey, puberulous; bracts 0.3 cm long.. .. ..*A. gangetica*

1. Branches and leaves green, glabrous or slightly pubescent; bracts more than 0.3 cm long.. .. .. ..*A. dalzelliana*

Asystasia dalzelliana Santapau in Kew Bull. 1948:276. 1948. *Asystasia violacea* Dalz. Ms. ex Cl. in Hk. f. FBI 4:494. 1884; C 2:467 (non Dalz. 1850).

Suffrutescent, 40–90 cm tall herbs. Leaves 4.5–18×2.8–6.5 cm, elliptic–lanceolate. Flowers pale–violet or purplish–lilac, in lax, terminal, unilateral spike–like racemes. Capsule 2–3 cm long, oblong, lower half columnar, empty, upper half 4–seeded, constricted between seeds. Seeds orbicular, tuberculate.

Dangs, along paths in the forest; common.

FLS : Aug.–Oct. *FRS :* Sep.–Dec.

Asystasia gangetica (L.) T. Anders. in Thw. Enum. 235. 1859–64. *Justicia gangetica* L. Amoen. Acad. 4:299. 1759. *Asystasia coromandeliana* Wt. ex Nees in Wall. Pl. As. Rar. 3:89. 1832; FBI 4:493; C 2:466. *Asystasia violacea* Dalz. in Kew Journ. Bot. 2:139. 1850 (non Dalz. ex Cl. 1884).

Suffruticose, straggling herbs. Leaves 1.5–3×1–1.3 cm, ovate or ovate–lanceolate, rarely obovate. Flowers white or pale–blue, lax, in unilateral, terminal, spike–like racemes.

Sanjan, Bulsar, Broach, Rajpipla, Vallabh Vidyanagar; not common.

FLS : Oct.–Dec.

BARLERIA L.

Key to species

1. Armed :
   2. Flowers yellow; capsule ovoid, with a solid beak, 2–seeded; outer sepals spinous–tipped :
      3. Bracteoles linear–subulate.. .. .. *B. prionitis*
      3. Bracteoles 0 or of a few, minute bristles.. *B. cuspidata*
   2. Flowers white or pale–blue; capsule oblong or ellipsoid, without solid beak, 4–seeded; outer sepals not spinous–tipped. .. .. *B. acanthoides*

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1. Unarmed :

4. Outer sepals spinous-tipped .. .. .. *B. cristata*

4. Outer sepals not spinous-tipped :

5. Corolla white; calyx pubescent.. .. ..*B. lawii*

5. Corolla pink or pale- to deep-purple; calyx glabrous or nearly so :

6. Plants erect; leaves coriaceous; corolla lobes 1.5-2 cm across; seeds hairy .. .. ..*B. gibsoni*

6. Plants suberect or diffuse; leaves membranous; corolla lobes 0.8-1.4 cm across; seeds not glabrous .. ..*B. prattensis*

Barleria acanthoides Vahl, Symb. Bot. 1:47. 1790; FBI 4:484; C 2:458: S & J 38.

30-45 cm tall shrubs. Leaves 2.5-5.5 × 0.8-1 cm, oblanceolate or obovate-oblong, appressed-hairy. Flowers solitary or 2-6 fascicled, in 1.5-6 cm long spikes. Capsule 1-1.2 cm long, ellipsoid, glabrous. Seeds broadly ovoid, compressed, hairy.

Kutch and Saurashtra; occasional.

FLS & FRS : Aug.-Oct.

Barleria cristata L. Sp. Pl. 636. 1753; FBI 4:488; C 2:460; WI 1:158; S & J 38.

40-70 cm tall undershrubs. Leaves 4-15 × 1-5.3 cm, ovate-elliptic, elliptic-oblong or lanceolate, appressed-pubescent. Flowers pale-blue or whitish, in axillary and terminal, dense spikes. Capsule 1-1.5 cm long, oblanceolate, glabrous. Seeds 4, ± 0.15 cm across, orbicular, compressed, glabrous.

Saurashtra, Panchmahals, Chhotaudepur, Dangs, in forest undergrowth; rare.

FLS : Sep.-Nov. *FRS :* Oct.-Dec.

Barleria cuspidata Heyne ex Nees in Wall. Pl. As. Rar. 3:93. 1832; FBI 4:483; C 2.458

Bushy shrubs, 60-75 cm tall. Leaves 3.2-7 × 1.5-3.2 cm, lanceolate, elliptic-lanceolate or oblong-lanceolate, glabrous. Flowers bright-yellow, axillary, solitary, in opposite axils, culminating into short, terminal spikes. Capsule 1.2-1.8 cm long, ovoid, 2-seeded. Seeds orbicular, compressed, hairy.

Kutch, Saurashtra and north Gujarat in forest undergrowth or rock cuttings; rare to occasional.

FLS & FRS : Aug.-Nov.

Barleria gibsoni Dalz. in Kew Journ Bot. 2:339. 1850; FBI 4:487; C 2:464.

Undershrubs, 60-100 cm tall. Leaves 4.5-12.5 × 2.2-5.9 cm, elliptic, glabrous. Flowers solitary, axillary and in terminal spikes. Outer sepal 3.5-4 × 1.5-2 cm, broadly elliptic, oblong or obovate-oblong. Capsules oblong, acuminate, glabrous.

Dangs (Saputara); rare.

FLS & FRS : Oct.

Barleria lawii T. Anders in Journ. Linn. Soc. 9:492. 1867; FBI 4:486; C 2:460. *Barleria longiflora* Grah. Cat. 161. 1839 (non L. f. nec Roxb.)

Erect, appressed-hairy, 1.2-1.8 m tall shrubs. Leaves 4-14 × 1.5-5.5 cm, elliptic or elliptic-lanceolate, appressed-hairy. Flowers axillary, solitary or few, in terminal, raceme-like cymes. Corolla 7-9 × 3.5-5 cm across, pubescent outside. Capsule 1.8-2.4 cm long, compressed, obovoid, narrowed at base

Dangs (Saputara); common and abundant.

FLS & FRS : Oct.-Dec.

Barleria prattensis Santapau in Kew Bull. 1948:487. 1949; S 202.

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40–90 cm tall undershrubs. Leaves 7.5-13.5×3–5.5 cm, elliptic or ovate-elliptic, glabrous. Flowers axillary, solitary and few in terminal cymes. Corolla 5.5-6.5×3.5–4 cm, bright- to deep-violet-purple. Capsule 1.3–2.5 cm long, glabrous. Seeds orbicular, compressed.

Throughout (except Kutch), in forest undergrowth and in shaded spots; common.

FLS & FRS : Sep.–Mar.

Barleria prionitis L. Sp. Pl. 636. 1753; FBI 4:482; C 2:457; WI 1:158. Pl. 24(1); Ch & O 179; S & J 38.

Erect or bushy shrubs, 1–1.5 m tall. Leaves 5–19.5×1.5–9 cm, narrowly to broadly elliptic-lanceolate, entire, appressed-hairy beneath. Flowers yellow, in axillary, spicate clusters and in terminal, 2.5–10.5 cm long, axillary and terminal spikes. Capsules 1–1.5 cm long, brown, glabrescent, beaked. Seeds orbicular, compressed, hairy.

Throughout, along roads and railway lines or in the forest undergrowth; common, subgregarious.

FLS : Sep.–Feb. *FRS :* Oct.–Mar.

BLEPHARIS Juss.

Key to species

1. Herbs; flowers 1–3, axillary :
   2. Leaves elliptic-lanceolate, petiolate, membranous, acute.. .. ..*B. maderaspatensis*
   2. Leaves obovate-oblong or oblong-spathulate, sessile, fleshy, obtuse . .. .*B. repens*
1. Small shrubs; flowers in pendulous, strobilate spike.. .. ..*B. linariaefolia*

Blepharis linariaefolia Pers. Syn. 2:180. 1807; WI 1:197; S & J 39. *Blepharis sindica* T. Anders. in Journ. Linn. Soc. 9:500. 1867; FBI 4:479; C 2:426.

Apparently dichotomous, bushy shrubs. Leaves sessile, 4-ternate, unequal, 2–5×0.2–0.5 cm, linear. Spikes 2.5–4 cm long, conical. Capsule ellipsoid, compressed, glabrous, shining. Seeds ovoid, flat, hairy on edges.

Kutch, Saurashtra and north Gujarat (Deesa cf. Cooke); common in first two localities.

FLS & FRS : Oct.–Dec.

Blepharis maderaspatensis (L.) Roth, Nov. Pl. Sp. 320. 1821; Ch & O 174; S & J 38. *Acanthus maderaspatenus* L. Sp. Pl. 892. 1753. *Blepharis boerhaviaefolia* Pers. Syn. 2:180. 1807; FBI 4:478; C 2:424.

Prostrate or procumbent, slender herbs. Leaves whorled, 4 at each node, 1.2-9×0 8–4.5 cm, hairy. Flowers 0.2-1.8×0.6–0.8 cm, creamy-white with red or purple veins or pale-blue. Capsule 0.6–0.8 cm long, brown, ovoid, glabrous, shining. Seeds 2, echinate.

Throughout, not common. (UNTIGAN, UTANJAN CHOKDI)

FLS & FRS : Oct.–Feb.

Blepharis repens (Vahl) Roth, Nov. Pl. Sp. 321. 1821; S & J 38. *Acanthus repens* Vahl, Symb. Bot. 2:76. 1791. *Blepharis molluginifolia* Pers. Syn. 2:180. 1807; FBI 4:479; C 2:425.

Prostrate herbs, rooting at nodes. Leaves 1–2.7×0 2–0.6 cm, whorled, 4 at each node. Flowers creamy-white or pale-blue, axillary, solitary, sessile. Capsule 0.6–0.8 cm long, compressed, ellipsoidal, enclosed in persistent calyx. Seeds 2, compressed spherical, with hairy margins

Throughout, not common (ZINKU UTINGAN)
FLS & FRS : Throughout the year.

CARVIA Bremek.

Carvia callosa (Nees) Bremek. in Verh Ned. Akad. Wet. (II) 40:187. 1944; S 199. *Strobilanthes callosus* Nees in Wall. Pl. As Rar. 3:85. 1832; FBI 4:451; C 2:444.

Scanned by CamScanner

1.5–2.5 m tall shrubs. Leaves 14–30 × 7–12.5 cm, elliptic-lanceolate or ovate-lanceolate, glabrous. Flowers bright-blue, in 4–6 cm long, axillary spikes. Capsules 1.5–1.8 cm long, ovoid, compressed. Seeds 0.7–0.9 × 0.6–0.7 cm, ovate-oblong, appressed-hairy.

Throughout in dry deciduous forests. (KARVI, KURVI)

FLS : Aug.–Sep. *FRS :* Oct.–Dec.

CROSSANDRA Salisb.

Crossandra infundibuliformis (L.) Nees in Wall. Pl. As. Rar. 3:98. 1832 & in DC. Prodr. 11:280. 1847; Bailey 917; WI 2:372. *Justicia infundibuliformis* L. Sp. Pl. 21. 1753. *Crossandra undulaefolia* Salisb. Parad. Lond. t. 12. 1805; FBI 4:492; C 2:455.

60–75 cm tall undershrubs. Leaves whorled, 10–15 × 3.5–5 cm, lanceolate, glabrous. Flowers pale-to bright-orange-coloured, in 7–15 cm long, 4-gonous spikes at ends of axillary peduncles. Capsules 1.5–1.8 cm long, oblong. Seeds 4, compressed, nearly orbicular, appressed-hairy.

Planted in gardens at some places. (ABOLI)

FLS & FRS : Almost throughout the year.

DICLIPTERA A. L. Juss. nom. cons.

Key to species

1. Seeds glochidiate; corolla ±0.5 cm long; flowers in axillary, sessile clusters and in short, terminal spikes .. *D. verticillata*
1. Seeds verrucose but not glochidiate; corolla 0.8–1.7 cm long; flowers in peduncled, axillary and terminal, lax cymes .. .. *D. roxburghiana*

Dicliptera roxburghiana Nees in Wall. Pl. As. Rar. 3:111. 1832; FBI 4:553; WI 3:57.

30–70 cm tall, erect or suberect herbs. Leaves 3.5–16 × 2–6.2 cm, ovate, ovate-lanceolate or elliptic-lanceolate, glabrous

with age. Flowers bright-purple. Capsules 0.6–1 cm long, obovoid, compressed, pubescent. Seeds 4, orbicular or nearly so.

Dangs and Rajpipla, in forest undergrowth; common.

FLS & FRS : Sep.–Mar.

Dicliptera verticillata (Forsk.) Christ. in Dansk. Bot. Arkiv. 4(3):11. 1922; Ch & O 182; S & J 39. *Dianthera verticillata* Forsk. Fl. Aegpt.-Arab. 1:9. 1775. *Dicliptera micranthes* Nees in Wall. Pl. As. Rar. 3:112. 1832; FBI 4:553; C 2:481.

An erect, suberect or diffuse herb, 20–60 cm tall. Leaves 2–8.5 × 0.8–4.2 cm, ovate-elliptic or elliptic-lanceolate, glabrous. Flowers bright-purple. Capsules 0.3–0.4 cm long, ellipsoid, pubescent near apex. Seeds 4, orbicular.

Throughout, in forest undergrowth and in shaded spots among grasses and along roads; common.

FLS & FRS : Oct.–Jan.

DIPTERACANTHUS Nees

Key to species

1. Capsule pubescent.. .. ..*D. prostratus*
1. Capsule glabrous.. .. ..*D. patulus*

Dipteracanthus patulus (Jacq.) Nees in Wall. Pl. As. Rar. 3:82. 1832; S & J 39. *Ruellia patula* Jacq. Misc. Bot. 2:358. 1781; FBI 4:412; C 2:432.

Suberect or diffuse, 20–40 cm tall herbs. Leaves 1.2–3.6 × 0.6–2 cm, ovate, ovate-oblong, elliptic-oblong or obovate, appressed-hairy. Flowers pale-violet or nearly white, axillary, solitary or fascicled. Capsules 1.2–1.5 × 0.4–0.5 cm, clavate. Seeds nearly spherical, densely hairy on margins.

Throughout; not common.

FLS & FRS : Throughout the year.

Scanned by CamScanner

Dipteracanthus prostratus (Poir.) Nees in Wall. Pl. As. Rar. 3:81. 1832; WI 3:90; Ch & O 176; S & J 39; S 196. *Ruellia prostrata* Poir. in Lam. Encycl. Meth. Bot. 3:347 1804; FBI 4:411. *Ruellia prostrata* Poir. var. *dejecta* Cl in Hk. f FBI 4:412. 1884; C 2:431.

Trailing or geniculately ascending, suberect, 30-75 cm tall herbs. Leaves 1.5–7×0.9-4 cm, ovate or ovate-elliptic, appressed -hairy. Flowers pale-purple or violet, sessile, axillary, solitary or 2-3-together. Capsules 1-2.2×0.3-0.6 cm, clavate, acute and shortly pointed at apex, tapering at base. Seeds flat, nearly spherical, appressed hairy on margins.

Throughout, in hedges and forest undergrowth; common. (KALI GHAVANI)

FLS & FRS : Throughout the year.

DYSCHORISTE Nees

Key to species

1. Anther cells minutely spurred (or almost spurless); corolla 2.5-3 cm long.. .. ..*D. dalzellii*
1. Anther cells distinctly long spurred; corolla not more than 2.5 cm long :
   2. Corolla not or scarcely exceeding the calyx .. *D. erecta*
   2. Corolla much longer than calyx.. .. .. *D. vagans*

Dyschoriste dalzellii (T. Anders. ex Bedd.) O. Ktze. Rev. Gen. Pl. 1:486. 1891; C 2:438. *Calophanes dalzellii* T. Anders. ex Bedd. Icon. Pl. Ind. Or. 1:60. t. 248. 1874; FBI 4:411.

Suberect or diffuse, 20–60 cm tall herbs. Leaves 2.5–8.5× 1.3–3.5 cm, ovate-oblong or elliptic, nearly glabrous. Flowers bluish, axillary, solitary or few in cymes. Capsules 1.3–1.5 cm long, oblong, glabrous, 4-seeded. Seeds orbicular, compressed, hygroscopically hairy.

Dangs and Rajpipla; very rare.

FLS : Oct.–Dec. *FRS :* Nov.–Mar.

Dyschoriste erecta (Burm. f.) O. Ktze. Rev. Gen. Pl. 485. 1891. *Ruellia erecta* Burm. f. Fl Ind. 135. t. 41. f. 3. 1768. *Dyschoriste depressa* Nees in Wall. Pl. As. Rar. 3:81. 1832; C 2:437. *Calophanes nagchana* Nees in DC. Prodr. 11:107. 1847; FBI 4:410.

Perennial herbs or shrubby. Leaves 1.8–4×1.2–2.5 cm, broadly elliptic or sometimes obovate, glabrous or nearly so. Flowers pinkish-purple, axillary, 1–4-fascicled. Capsules 0.8–1.2 cm long. Seeds 4, broadly elliptic or nearly spherical, densely hygroscopically hairy.

Listed by Cooke from Dangs.

FLS : Apr.

Dyschoriste vagans (Wt.) O. Ktze. Rev. Gen. Pl. 1:486. 1891; C 2:438. *Calophanes vagans* Wt. Icon. t. 1526. 1850; FBI 4:411.

Glandular-pubescent, shrubby. Leaves 3.5–6.5×1.8–3 cm, ovate. Flowers fowl-smelling, axillary, solitary or in 2-6-flowered cymes. Capsules 1–1.5 cm long, oblong, glabrous. Seeds broadly elliptic or nearly spherical, densely hygroscopically hairy.

Listed by Patel R. M. (1971) from Bulsar.

FLS : Oct.–Dec.

ELYTRARIA A. Mich. nom. cons.

Elytraria acaulis (L. f.) Lindau in Pfam. Nachtr. 1:304. 1897; WI 3:167; S & J 39. *Justicia acaulis* L. f. Suppl. 84. 1781. *Elytraria crenata* Vahl, Enum. 1:106. 1804; FBI 4:394. *Tubiflora acaulis* (L. f.) O. Ktze. Rev. Gen. Pl. 1:500. 1891; C 2:420.

A scapigerous herb. Leaves 5–14×1.5–5.5 cm, obovate or oblanceolate, glabrous but for sparsely hairy nerves beneath, crenate. Flowers white, in 3–24 cm long, rigid, simple, rarely branched spikes. Capsules 0.4–0.6 cm long, ovoid, acute.

Throughout in plains in exposed or shaded ground.

FLS & FRS : July-Nov.

Scanned by CamScanner

ERANTHEMUM L.

Key to species

1. Bracts whitish with dark-green nerves, not glandular-pubescent :-
   2. Bracts obovate, densely hairy on midrib and margin, obtuse and minutely mucronate or apiculate; spikes 7.5–15 cm long.. .. ..*E. roseum*
   2. Bracts ovate-elliptic, glabrous; spikes upto 7.5 cm long.. .. .. *E. nervosum*
1. Bracts green, seldom nearly white when mature, glandular-pubescent.. .. .. *E. purpurascens*

Eranthemum nervosum (Vahl) R. Br. Prodr. 1:477. 1810; S & J 39. *Justicia nervosum* Vahl, Enum. 1:164. 1805. *Daedalacanthus nervosus* T. Anders. in Journ. Linn. Soc. 9:487. 1867; FBI 4:418; C 2:441.

0.9–2 m tall undershrubs or shrubs. Leaves 5–15 × 2.5–8 cm, elliptic-lanceolate, petiolate. Flowers blue, in terminal and axillary, simple or branched spikes.

Cultivated in gardens. The author collected it from Public Park, Baroda.

FLS & FRS : Dec.–Apr.

Eranthemum purpurascens Nees in Wall. Pl. As. Rar. 3:106. 1832. *Justicia pulchella* Roxb. Pl. Cor. 2 : t. 117. 1798. *Eranthemum pulchellum* (Roxb.) Fl. Ind. 1:111. 1832 (non Andr.). *Daedalacanthus purpurascens* T. Anders. in Journ. Linn. Soc. 9:488. 1867; FBI 4:420; C 1:440.

90–120 cm tall undershrubs or woody herbs Leaves 5–20 × 2.5–9 cm, ovate. Flowers blue, in axillary, simple, seldom branched spikes. Capsules clavate-oblong, glabrous. Seeds broadly ellipsoid, densely hairy.

Saurashtra and Dangs (Unai); occasional

FLS : Oct.

Eranthemum roseum (Vahl) R. Br. Prodr. 477. 1810; WI 3:183; Ch & O 177; S & J 39; S 197. *Justicia rosea* Vahl. Enum. 1:165. 1804 *Daedalacanthus roseus* T. Anders. in Journ. Linn. Soc. 9:487. 1887; FBI 4:419; C 2:439.

70–100 cm tall, shrubs or undershrubs. Leaves 5–25 × 1–11 cm, coriaceous, elliptic, elliptic-lanceolate or oblong-lanceolate, pubescent beneath. Flowers blue when fresh, rose-coloured afterwards, brown on drying. Capsule 1–1.2 cm long, clavate, pubescent, reddish-brown. Seeds spherical, glabrous, smooth, thick margined.

Throughout, in forest undergrowth and shaded places; common, at some places abundant. (DASHMULI)

FLS & FRS : Oct.–Mar.

GANTELBUA Bremek.

Gantelbua urens (Heyne ex Roth) Bremek in Verh. Nederl. Akad. Wet. (II) 40(1) : 148. 1944; Santapau in Univ. Bombay bot. Mem. 2:30. 1951. *Ruellia urens* Heyne ex Roth, Nov. Pl. Sp. 302. 1821. *Ruellia dura* Nees in Hk. Comp. Bot. Mag. 2:311. 1836. *Hemigraphis dura* T. Anders. in Journ. Linn. Soc. 9:461. 1867 (excl. syn. *R. crispa* Nees non L.); FBI 4:422; C 2:433.

Densely, strigosely hairy, diffuse herbs. Leaves 1.5–4 × 0.9–2.2 cm, elliptic-oblong or obovate-oblong, strigosely hairy. Flowers bright-rosy-purple, in involucrate heads. Capsule 0.8–1 cm long, linear-oblong, glabrous. Seeds broadly ellipsoid or suborbicular, yellowish-brown.

Bulsar, Bilimora, Unai, Rajpipla, Broach, locally abundant and in small or large patches.

HAPLANTHUS Nees

Key to species

1. Plants robust; cladodes 2–3.5 cm long, stout, with 2 sharp spines at tip; bracteoles longer than calyx; corolla bright- to deep-purple; capsule 1.5–1.8 cm long, glabrous..*H verticillatus*

Scanned by CamScanner

1. Slender plants; cladodes 1–1.5 cm, long, slender or nearly filiform, not spinous at apex; bracteoles shorter than calyx; corolla dirty-white with purple dots; capsule 0.7–0.9 cm long hairy :

2. Inflorescence in whorls, mostly collected in terminal spikes .. ..*H. neilgherryensis*

2. Inflorescence whorls scattered along stem and branches but not collected in terminal spikes .. .. *H. tentaculatus* var. *tentaculatus*

Haplanthus neilgherryensis Wt. Icon. t. 1556. 1850; S 200. *Haplanthus tentaculatus* Nees var. *neilgherryensis* (Wt.) Cl. in Hk. f. FBI 4:507. 1884. *Haplanthus tentaculatus* Nees in DC. Prodr. 11:513. 1847; C 2:453 (ambo p. p.).

A slender, suberect or diffuse, 30–60 cm tall herb. Leaves 2.3–11.5×1.2–6.3 cm, ovate, elliptic-oblong, appressed-hairy. Spikes terminal 2–7.5 cm long. Capsules 0.6–0.9 cm long, oblong, pointed, pubescent. Seeds yellowish-brown, oblong.

Throughout (except Kutch) in forest undergrowth or in shaded places.

FLS & FRS : Oct.-Mar.

Haplanthus tentaculatus Nees var. **tentaculatus**; S 200. *Haplanthus tentaculatus* Nees in DC. Prodr. 11:513. 1847; FBI 507; C 2:453 (ambo p. p.)

25–75 cm tall, slender, erect herbs. Leaves 2.5–14.5×1.5–7.5 cm, ovate, membranous, glabrous or nearly so. Spikes 2–8 cm long. Capsules 0.6–0.8 cm long, oblong.

In undergrowth at Bulsar, Dangs, Mahi ravines and Saurashtra.

FLS & FRS : Oct.-Jan.

Haplanthus verticillatus (Roxb.) Nees in DC. Prodr. 11:513. 1847; FBI 4:506; C 2:452; WI 5:6; Ch & O 178; S 200. *Justicia verticiliata* Roxb. Fl. Ind. 1:135. 1832.

Rigid herbs, 30–90 cm tall, glandular-pubescent. Leaves 4–17×1.8–8 cm, ovate-oblong, elliptic-oblong, glabrescent at length. Flowers in axils of cladodes. Capsules oblong, grooved. Seeds yellowish-brown, oblong, compressed.

Throughout, in deciduous forests; common. (KALU KARIYATU)

FLS : Oct.-Dec. *FRS ;* Oct.-Mar.

HEMIADELPHUS Nees

Hemiadelphus polyspermus (Roxb.) Nees in Wall. Pl. As. Rar. 3:80. 1832; S & J 39; S 195. *Justicia polysperma* Roxb. Hort. Beng. 3. 1814 (nomen) & Fl. Ind. 1:119. 1832. *Hygrophila polysperma* (Roxb.) T. Anders. in Journ. Linn. Soc. 9:456. 1867; FBI 4:406; C 2:429; Ch & O 175.

Procumbent or suberect herbs, 10–25 cm tall. Leaves 1–4.5 ×0.3–1.1 cm, linear-lanceolate, elliptic-lanceolate or oblong, nearly glabrous. Flowers pale-blue or nearly white, in 1.5–6 cm long, cylindric spikes. Capsules 0.6–0.8 cm long, linear-cylindric, grooved, pubescent towards apex. Seeds minute, orbicular, compressed, hairy on margins.

Vyara, Broach, Rajpipla, Chhotaudepur, Panchmahals, Baroda, north Gujarat and Saurashtra; not common.

FLS & FRS : Oct.-Jan.

HEMIGRAPHIS Nees

Key to species

1. Corolla limb ventricose; lower filaments hairy below...*H. hirta*

1. Corolla limb narrowly funnel-shaped; lower filaments densely bearded in their upper half :

2. Bracts of inner flowers not longer than calyx; seeds 6.. .. ..*H. latebrosa* var. *heyneana*

2. Bracts of inner flowers longer than calyx; seeds 8–10.. .. ..*H crenata*

Scanned by CamScanner

Hemigraphis crenata (Bth. ex Hohenack.) Bremek. in Mat. Mon. Strob. 137. 1944. *Ruellia crenata* Bth. ex Hohenack. in Flora 31:558 1849. *Hemigraphis elegans* Nees var. *crenata* (Bth. ex Hohenack.) Cl. in Hk. f. FBI 4:425. 1884; C 2:435.

This species is included on the authority of Saxton & Sedgwick (1918, p. 289), who collected it from a moist place near water course at Modasa (North Gujarat).

FLS : Mar.

Hemigraphis hirta (Vahl) T. Anders. in Journ. Linn. Soc. 9:462. 1867; FBI 4:422; Oza in Journ. Bombay nat. Hist. Soc. 71:634–635. 1974. *Ruellia hirta* Vahl, Symb. Bot. 3:84. t. 67. 1794.

Softly pubescent, creeping, herbs. Leaves 1.5-3×1-1.2 cm, ovate, sessile. Flowers pale-blue, few, in condensed, terminal heads. Capsule 0.6-0.8 cm long, linear to linear-ovoid, 12-seeded.

Por near Baroda.

FLS & FRS : April

Hemigraphis latebrosa (Heyne ex Roth) Nees var. **heyneana** Bremek. in Verh. Nederl. Acad. Wet. (II) 40(1):139. 1944; Ch & O 176; S 196. *Ruellia latebrosa* Heyne ex Roth, Nov. Pl. Sp. 307. 1821. *Hemigraphis latebrosa* (Heyne ex Roth) Nees in DC. Prodr. 11:723. 1847; FBI 4:423; C 2:434; S & J 39.

Slender, erect or suberect, 40-75 cm tall herbs. Leaves 2.5-11×1.2-8.1 cm, ovate, membranous, sparingly hairy. Flowers white with bright-purple or blue mouth, in terminal and axillary spikes. Capsules 0.8–1 cm long, linear-oblong, apiculate, thinly pubescent. Seeds broadly ellipsoid or suborbicular, hairy.

Throughout (except Kutch) in hedges, in shaded spots and in forest undergrowth.

FLS & FRS : Oct.–Mar.

HYGROPHILA R. Br.

Key to species

1. Erect, flowers in axillary whorls at each node; corolla 2.5-3 cm long.. .. ..*H. auriculata*

1. Prostrate or ascending; flowers in terminal spikes; corolla 1–1.3 cm long.. .. ..*H. serpyllum*

Hygrophila auriculata (Schum.) Heine in Kew Bull. 16:172. 1962; Ch & O 175; S & J 39; S 194. *Barleria longifolia* L. Cent. Pl. 2:222. 1756 & Amoen. Acad. 4:320. 1759 (non *Hygrophila longifolia* Nees 1847). *Barleria auriculata* Schum. in Schum. & Thonn. Besker. Guin. Pl. 285. 1827. *Asteracantha longifolia* Nees in Wall. Pl. As. Rar. 3:90. 1832; C 2:428; WI 1:133. Pl. 17(3). *Hygrophila spinosa* T. Anders. in Thw. Enum. 225. 1860; FBI 4:408.

Armed, annual herbs or undershrubs, 30–60 cm tall; bark dark-brown. Leaves 7–15×0.8–1.8 cm, elliptic-lanceolate, hispid, sessile. Flowers bluish-purple. Capsules 0.6–1 cm long, linear-oblong, pointed, glabrous, 4–8-seeded. Seeds dark-brown, hairy, spherical.

Throughout, in damp places; common, gregarious. (KANTA-SHELIO; AKARO, AKHARO, TALIMKHANA)

FLS & FRS : Sep.–Mar.

Hygrophila serpyllum (Nees) T. Anders. in Journ. Linn. Soc. 9:456. 1867; FBI 4:406; C 2:429; WI 5:148; S & J 39; S 195. *Physichilus serpyllum* Nees in Hk. Comp. Bot. Mag. 2:311. 1837.

Unarmed herbs. Leaves 1–3.8×0.6–2.3 cm, ovate, elliptic or nearly orbicular, hairy. Flowers bright-purple or bluish-purple, with white streaks within on lower lip, in 3–10.5 cm long spikes. Capsule 0.8–1 cm long, narrowly oblong or linear, grooved, pointed at apex, thinly pubescent. Seeds 8–16, orbicular, hairy on margins.

Throughout, in drying moist ground and cultivated fields. (SARPAT)

FLS & FRS : Oct.–Mar.

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JUSTICIA L.

Key to species and varieties

1. Calyx 5-partite :
   2. Bracts ovate or lanceolate, white with green veins .. .. *J. betonica*
   2. Bracts linear, very small and not as above .. *J. gendarussa*
1. Calyx 4-partite :
   3. Flowers 1-4-nate, axillary; capsule dimorphous .. .. *J. heterocarpa*
   3. Flowers in spikes; capsule not dimorphous :
      4. Spikes cylindric; bracts and bracteoles as long as or longer than calyx lobes :
         5. Bracts and bracteoles very slender and long, with distant, spreading bulbous based white hairs; leaves with raphides irregularly arranged in the middle, transversely near the margins .. .. *J. micrantha*
         5. Bracts and bracteoles linear, pectinately white ciliate and scabrous hirsute; raphides concentrically transverse and curved .. .. .. *J. procumbens*
         5. Bracts elliptic-ovate; bracteoles narrower though similar; raphides concentrically transverse .. .. *J. simplex*
      4. Spikes linear; bracts and bracteoles shorter than calyx lobes, all scarious margined :
         6. Bracts, bracteoles and calyx lobes obtuse at apex :
            7. Leaves 2.5–8×0.4–0.9 cm, linear-oblong or linear-lanceolate; spikes 3–13 cm long .. .. *J. quinqueangularis* var. *quinqueangularis*
            7. Leaves 1.2–3×0.5–1.5 cm, oblong or elliptic-oblong; spikes 1–2 cm long .. .. *J. quinqueangularis* var. *peploides*
         6. Bracts, bracteoles and calyx lobes acute at apex :
            8. Bracts and bracteoles about 0 25 cm long, fairly densely hairy .. .. *J. prostrata*

8. Bracts and bracteoles scarcely 0.12 cm long, more or less glabrous except for a bunch of hairs at apex .. .. *J. diffusa*

Justicia betonica L. Sp. Pl. 15. 1753; FBI 4:525; WI 5:312; S 208. *Adhatoda betonica* (L.) Nees in Wall. Pl. As. Rar. 3:103. 1832 & DC. Prodr. 11:385. 1847. *Justicia ramosissima* Roxb Fl. Ind. 1:129. 1832. *Justicia betonica* L. var. *ramosissima* (Roxb) Cl. in Hk. f FBI 4:525. 1885; C 2:486.

An erect, 35–70 cm tall undershrubs or suffrutescent herbs. Leaves 3.5–7×1.1–3.4 cm, glabrous but for ciliate margins. Flowers white with a tinge of pink, in axillary and terminal, simple or branched, 4–16 cm long spikes. Capsules 1–1.5×0.5–0.8 cm, broadly clavate, softly pubescent. Seeds orbicular, tuberculately rugose.

Dangs, common.

FLS & FRS : Sep.–Oct.

Justicia diffusa Willd. Sp. Pl. 1:87. 1797; FBI 4:538; C 2:489; Ch & O 184; S & J 39.

Diffuse herbs, 20–50 cm tall. Leaves 2.5–3.8×0.7–1.2 cm, ovate to ovate-elliptic, appressed-hairy. Flowers pale- to bright-pink or purple, in erect, axillary and terminal, 5–7.5 cm long spikes. Capsule 0.2–0.4 cm long, appressed-hairy, oblong. Seeds minute, nearly spherical, somewhat concentrically rugose.

Throughout, among grasses in shaded spots and in forest undergrowth; common.

FLS & FRS : July–Dec.

Justicia gendarussa Burm. f. Fl. Ind. 10. 1768; FBI 4:532; C 2:492; WI 5:312; S & J 39. *Gendarussa vulgaris* Nees in Wall. Pl. As. Rar. 3:104. 1832.

Perennial, evergreen undershrubs, 60–120 cm tall. Leaves 4–11×0.8–2.6 cm, lanceolate, glabrous. Flowers creamy-white

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or very pale-yellow with brown or dark-purple spots within, in 3–10 cm long, terminal, compact spikes. Fruits not seen.

Cultivated as a border plant; seldom an escape in waste places; native of China.

FLS : Throughout the year.

Justicia heterocarpa T. Anders. in Journ. Linn. Soc. 7:41. 1864; FBI 4:531; C 2:486.

30–60 cm tall, annual herbs. Leaves 2–6 × 1–2.5 cm, ovate or ovate-lanceolate, glabrous. Flowers white. Capsules dimorphic, normal ones ellipsoid, pubescent near apex, abnormal ones ellipsoid with 3-6, vertical, pectinate wings. Seeds of normal capsules tuberculate, those of abnormal capsules smooth.

Kutch, Saurashtra and north Gujarat (Deesa cf. Cooke and Mahudi); common at Mahudi in hedges.

FLS & FRS : Oct.–Jan.

Justicia micrantha Heyne ex Wall. Cat. 2449. 1830 (nomen) ex Cl. in Hk. f. FBI 4:536. 1885; C 2:489; S & J 39.

This species is listed by Shah (1964) (sp. no. 1229) from Broach and by Santapau & Janardhanan from Saurashtra. It is also listed by Dr. Bedi (1970) from Ratan Mahals.

FLS & FRS: Oct.–Dec.

Justicia procumbens L. Sp. Pl. 15. 1753; FBI 4:539; C 2:491; WI 3:313. f. 161; Ch & O 183; S & J 40.

30-60 cm tall, slender, suberect or diffuse herbs Leaves 1–6.5 × 0.5–3.4 cm, ovate or elliptic, appressed-hairy. Flowers bright-rosy-purple or lilac, in 1.5–7.5 cm long, compact, terminal spikes. Capsules 0.4–0.6 cm long, glabrous, oblong. Seeds nearly spherical, tuberculate.

Throughout among grasses and in forest undergrowth; frequent.

FLS & FRS: July–Dec.

Justicia prostrata (Cl.) Gamble in Fl. Madras 1081. 1924; Ch & O 184. *Justicia diffusa* Willd. var. *prostrata* Cl. in Hk. f. FBI 4:538. 1885; C 2:490.

Prostrate herbs; branches diffusely spreading from a stout root-stock. Leaves 0.7–2.8 × 0.5–1.5 cm, ovate or orbicular at times lanceolate, membranous. Flowers bright-pink to purple, in axillary and terminal, erect, compact, 4–8 cm long spikes. Capsules 0.3–0.4 cm long, pubescent.

Pavagadh, where it is fairly abundant; also from Baroda and Saurashtra

FLS & FRS: Oct.–May

Justicia quinqueangularis Koen. ex Roxb. var. **peploides** (Nees) Cl. in Hk. f. FBI 4:537. 1885; C 2:490; S & J 40. *Rostellaria peploides* Nees in Wall. Pl. As. Rar. 3:101. 1832.

Slender herbs. Leaves 1.2–3 × 0.5–1.5 cm, petiolate, glabrous, oblong or elliptic-oblong, rarely obovate. Spikes terminal, 1–2 cm long. Capsules 0.3–0.5 cm long, glabrous.

Saurashtra.

FLS & FRS : Sep.–Oct.

Justicia quinqueangularis Koen ex Roxb. var. **quinqueangularis.** *Justicia quinqueangularis* Koen. ex Roxb. Hort. Beng. 80. 1814 (nomen) & Fl. Ind. 1:134. 1832; FBI 4:536; C 2:490; S & J 40. *Rostellaria quinqueangularis* Nees in Wall. Pl. As. Rar. 3:101. 1832 & DC. Prodr. 11:375. 1847.

Slender, glabrous herbs. Leaves linear-oblong or linear-lanceolate, glabrous. Flowers bright-pink or purple, in slender, terminal spikes. Capsules 0.6–0.8 cm long, oblong, glabrous. Seeds nearly spherical, reticulately rugose.

Saurashtra.

FLS & FRS: Sep.–Oct,

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Justicia simplex D. Don, Prodr. Fl. Nep. 118. 1825; FBI 4:539; C 2:490; WI 5:313; S & J 40.

Erect or diffuse herbs, 20-50 cm tall. Leaves 2.5-6×1.2-2.5 cm, ovate-oblong, lanceolate or elliptic-lanceolate, rarely obovate, appressed-hairy. Flowers pale-to bright-rosy-purple, in axillary and terminal, 5-12.5 cm long spikes. Capsules 0.4-0.7 cm long, linear-oblong, pubescent near tip. Seeds nearly globose, pale-to dark-brown, glabrous, rugose.

Throughout, everywhere.

FLS & FRS : Aug.-Feb.

LEPIDAGATHIS Willd.

Key to species

1. Undershrubs; flowers yellow or creamy-yellow; seeds 4.. .. .. *L. cuspidata*
1. Herbs; flowers white or pale-to bright-pink or rosy-purple; seeds 2 :
   2. Calyx 4-partite.. .. .. *L. cristata*
   2. Calyx 5-partite.. .. .. *L. trinervis*

Lepidagathis cristata Willd. Sp. Pl. 3:400. 1800; FBI 4:516; C 2:470; WI 6:70.

Perennial herbs, with slender, erect or diffuse branches. Leaves 2.5-8×0.6-1.2 cm, linear-oblong, hairy on nerves beneath. Flowers in spikes forming globose, radical or subradical, 1-1.5 cm broad heads. Capsules 0.4-0.6 cm long, ovoid, glabrous. Seeds nearly spherical or ovoid-oblong, hygroscopically hairy.

North Gujarat (Idar); a few plants seen on old walls of the fort and hilly slopes.

FLS & FRS : Oct.-Nov.

Lepidagathis cuspidata Nees in Wall. Pl. As. Rar. 3:97. 1832; FBI 4:519; C 2:474; Ch & O 190; S & J 40; S 205.

30-100 cm tall undershrubs. Leaves 3-10×1.2-4.2 cm, ovate, elliptic-oblong or elliptic-lanceolate, glabrous at length. Spikes 2-10 cm long, axillary or from axills of fallen leaves. Capsules 0.7-1 cm long, ovoid-lanceolate, glabrous.

In deciduous forests in undergrowth; not common.

FLS & FRS : Dec.-Apr.

Lepidagathis trinervis Wall. ex Nees in Wall. Pl. As. Rar. 3:96. 1832; FBI 4:517; C 2:471; WI 6:70; Ch & O 181; S & J 40.

A perennial herb, with slender, erect or diffuse branches. Leaves 1.5-6.5×0.2-0.6 cm, glabrous, linear. Flowers in 1.2-2.2 cm long spikes, ultimately forming 2.5-6 cm broad, globose or oblong, radical heads. Capsules 0.4-0.6 cm long, ovoid-lanceolate, compressed. Seeds brown, smooth, hygroscopically hairy.

Throughout, among grasses; common. (HARANCHARO, PANIRU)

FLS & FRS : Aug.-Apr.

MONECHMA Hochst.

Monechma debile (Forsk.) Nees in DC. Prodr. 11:411. 1847; S & J 40. *Dianthera debilis* Forsk. Fl. Aegpt.-Arab. 9. 1775. *Monechma bracteatum* Hochst. in Flora 24:375. 1841; C 2:492.

30-75 cm tall herbs. Leaves 6-10×2.5-3.5 cm, membranous, glabrous or nearly so, ovate-oblong or oblong-lanceolate. Spikes axillary, subsessile, 2-7 cm long. Capsules 0.5-0.6 cm long, clavate, pubescent. Seeds flat, almost spherical, glabrous.

Saurashtra-Jamnagar; frequent.

FLS & FRS : Oct.-May

NELSONIA R. Br.

Nelsonia canescens (Lam.) Nees in DC. Prodr. 9:67. 1845; Bremek. in Reinwardt. 3:248. 1954-56; WI 7:7. *Justicia canescens* Lam. Ill. 1:40 & 41. 1791. *Nelsonia campestris* R. Br. Prodr. 481. 1810; FBI 4:394; C 2:420. *Nelsonia brunnelloides* O.Ktze. Rev. Gen. Pl. 493. 1891 (non *Justicia brunnelloides* Lam. 1791).

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Suffruticose, diffuse herbs. Leaves 4–6.5×2–3 cm, obovate –oblong or elliptic-oblong, villous in younger parts, glabrous at length. Flowers bluish-purple, in 1–3 cm long, axillary and terminal spikes. Capsule 0.4–0.5 cm long, ovoid, glabrous. Seeds ellipsoidal, brown.

Dangs, Rajpipla and Panchmahals; rare.

FLS & FRS : Jan.–Apr.

NEURACANTHUS Nees

Key to species

1. Spikes condensed into a compact head; corolla nearly regular, cup–like.. .. ..*N. sphaerostachyus*

1. Spikes elongate, 4-gonous; corolla bilipped.....*N. trinervius*

Neuracanthus sphaerostachyus (Nees) Dalz. in Kew Journ. Bot. 2:140. 1850; FBI 4:491; C 2:465; WI 7:18; Ch & O 179; S & J 40; S 203. *Lepidagathis sphaerostachya* Nees in DC. Prodr. 11:254. 1847.

Erect, simple or branched, suffrutescent herbs, 25–75 cm tall. Leaves 4.2–13×2.5–7.5 cm, elliptic-oblong, obovate-oblong or ovate- oblong, coriaceous. Flowers blue to bluish-purple, in 2–3.5 cm long, nearly globose or cylindric, axillary spikes. Capsules 0.7–1 cm long, glabrous, linear-cylindric. Seeds orbicular, densely silky, compressed.

Throughout, common. (GANTHERA)

FLS & FRS: Aug.–Jan.

Neuracanthus trinervius Wt. Icon. t. 1532. 1850; FBI 4:491; C 2:465; S 203.

30–65 cm tall, erect herbs. Leaves 4.5–21×2.1–7.2 cm, sessile, elliptic-oblong or elliptic-lanceolate, glabrous. Flowers 1–1.2 cm long, blue, in 2.5–13.5 cm long, axillary spikes. Capsules 0.5–0.7 cm long, oblong, 4-gonous, glabrous, slightly compressed between seeds. Seeds 4, orbicular, pubescent.

Dangs (Malegaon) in dense forest undergrowth; fairly common.

FLS & FRS : Nov.–Mar.

PERISTROPHE Nees

Peristrophe bicalyculata (Retz.) Nees in Wall. Pl. As. Rar. 3:113. 1812; FBI 4:554; C 2:495; WI 7:313.f. 138; Ch & O 185; S & J 40; S 211. *Dianthera bicalyculata* Retz. in Act. Holm. 297. t. 9. 1775.

Erect herbs, 1–1.5 m tall, with 4–6 angled, spreading or geniculately ascending branches. Leaves 3.2–10×1.7–4.3 cm, ovate or elliptic–ovate, appressed-hairy. Panicles axillary and terminal, trichotomously branched. Capsules 0.8–1 cm long, pubescent in upper half, shortly beaked. Seeds 4, orbicular, minutely hairy.

Throughout, in hedges and in forest undergrowth. (ADHEDI, LISI ADHEDI, KALI ANGHEDI)

FLS & FRS : Oct.–Apr.

PETALIDIUM Nees

Petalidium barlerioides (Roth) Nees in Wall. Pl. As. Rar. 3:82. 1832; FBI 4:416; C 2:435. *Ruellia barlerioides* Roth, Nov. Pl. Sp. 319. 1821.

100–150 cm tall undershrubs. Leaves 2–9×1.3–6.5 cm, broadly ovate, nearly glabrous, acuminate, decurrent at base, petiolate. Flowers yellow, solitary or crowded on short, lateral branches. Capsules 0.8–1×0.5–0.6 cm, linear–cylindric, compressed, blackish-brown, nearly glabrous. Seeds nearly orbicular, brown, smooth, glabrous.

Dangs, Rajpipla, Chhotaudepur, Panchmahals and north Gujarat (Modasa); rare. (Polo forest)

FLS & FRS : Dec.–Mar.

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PSEUDERANTHEMUM Radlk.

Pseuderanthemum bicolor (Schrank) Radlk. ex Lindau in Pfam. 4(3B) : 330. f. 133 A–D. 1895; Santapau in Univ. Bombay bot. Mem. 2:70. 1951. *Eranthemum bicolor* Schrank, Pl Rar. Hort. Monac. t. 8. 1819; C 2:468. *Eranthemum aspersum* Hk. f. Bot. Mag. t. 5711. 1868.

Shrubs. Leaves 4–15×3.5–7 cm, elliptic-ovate or elliptic-oblong, glabrous or nearly so. Flowers 2–2.5 cm long white, streaked pink or purple, in 9–22 cm long, terminal and axillary spikes. Capsule about 2 cm long, hairy, stalked.

Ornamental; native of Polynesia.

FLS & FRS : Most part of the year.

RHINACANTHUS Nees

Rhinacanthus nasuta (L.) Kurz in Journ. As. Soc. Beng. 39:79 1870; WI 9:6. f. 5; S 210. *Justicia nasuta* L. Sp. Pl. 16.1753. *Rhinacanthus communis* Nees in Wall. Pl. As. Rar. 3:109. 1832; FBI 4:541; C 2:494.

An erect shrub, 100–165 cm tall. Leaves 5–19×2–5.5 cm, ovate-elliptic, or elliptic-lanceolate, pubescent atleast when young. Flowers white with purple mottling, in 5–10 cm long, terminal and axillary, trichotomous cymes. Capsules 1.2–1.7 cm long, pubescent, pointed. Seeds nearly spherical, minute tuberculate, glabrous.

At Broach and Bulsar; at times cultivated.

FLS & FRS : Dec.–Feb.

RUELLIA L.

Ruellia tuberosa L. Sp. Pl. 635. 1753; S & J 40; WI 9:90.

An erect, suberect or diffuse, perennial herb, 30–45 cm tall, with tuberous roots. Leaves 4–9×1.5–4 cm, elliptic-oblong, nearly glabrous. Flowers bluish-purple or deep-blue, rarely white,

in axillary cymes. Capsules 1.5–2.5 cm long, cylindric-oblong, shortly beaked, glabrous. Seeds many, compressed, nearly spherical, densely hairy on margins.

Native of America; found in some places as a weed in gardens and cultivated fields. White flowers have been observed by the author in the botanical garden of Sir P. T. Science College, Surat.

FLS & FRS : July-May

RUNGIA Nees

Key to species

1. Bracts dimorphic; upper lip of corolla not emarginate or notched :
   2. Fertile bracts glabrous except for ciliate margins.. .. .. *R. parviflora*
   2. Fertile bracts villous.. .. .. *R. pectinata*
1. Bracts uniform; upper lip of corolla notched or emarginate :
   3. Stem erect, densely hairy; capsule obovoid, obtuse.. .. .. *R. elegans*
   3. Stem decumbent, glabrescent; capsule ovoid, acute.. .. .. *R. repens*

Rungia elegans Dalz. in Dalz. & Gibs. Bombay Fl. 196. 1861; FBI 4:549; C 2:480; S & J 40.

15–30 cm tall, erect herbs. Leaves 2.5–6×1–1.8 cm, elliptic–lanceolate, glabrous or nearly so. Flowers blue, in terminal, 2–6 cm long spikes. Capsule 0.4–0.6 cm long, obovoid, pubescent. Seeds suborbicular, rugose, pale-yellow or brown.

Saurashtra; Saxton & Sedgwick (1918, p. 269) also listed it from north Gujarat (Modasa Petha) where it was extremely rare.

FLS & FRS : Nov.–Jan.

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Rungia parviflora Nees in Wall. Pl. As. Rar. 3:110. 1832 & in DC. Prodr. 11:469. 1847; Ch & O 181; S & J 40.

This species is very similar to *R. pectinata* Nees but differs in hairiness on fertile bracts.

Saurashtra, Pavagadh, Bulsar. (KHADSELIO)

FLS & FRS : Aug.-Oct.

Rungia pectinata (L.) Nees in DC. Prodr. 11:469. 1847; Ch & O 181; S 206; S & J 40; WI 9:93. *Justicia pectinata* L. Amoen. Acad. 4:299. 1759 & Sp. Pl. (ed. 2) 22. 1763. *Rungia parviflora* Nees var. *pectinata* (L.) Cl. in Hk. f. FBI 4:550. 1885; C 2:478.

15–40 cm tall, suberect or diffuse herbs. Leaves 2.3–10 × 1–4 cm, elliptic–oblong or elliptic–lanceolate, glabrous or very sparsely hairy. Flowers blue, in axillary and terminal, solitary or 2–3-fascicled, 0.5–2 cm long spikes. Capsules 0.15–0.2 cm long, compressed, ovoid, pubescent at tip. Seeds orbicular, compressed, minutely echinulate.

Throughout; common, in shaded spots. (KHADSELIO)

FLS & FRS : Sep.–Mar.

Rungia repens (L.) Nees in Wall. Pl. As. Rar. 3:110. 1832; FBI 4:549; C 2:480; Ch & O 181; S 206; WI 9:93. *Justicia repens* L. Sp. Pl. 15. 1753.

Annual, suffruticose, suberect or diffuse herbs. Leaves 2.3 –10 × 1–4 cm, elliptic–oblong or elliptic–lanceolate, glabrous or nearly so. Flowers blue, in 2–15 cm long, terminal, 4-gonous spikes. Capsule 0.4–0.5 cm long, ovoid, compressed, pubescent near apex. Seeds nearly spherical, rugose, pale-brown.

Throughout, a weed among grasses and cultivated fields.

FLS & FRS : Aug.-Jan.

STAUROGYNE Wall.

Staurogyne zeylanica (Nees) O. Ktze. Rev. Gen. Pl. 1:497. 1891; C 2:422. *Ebermaiera zeylanica* Nees in DC. Prodr. 11:74. 1847; FBI 4:397.

Annuals, diffuse, 15–30 cm tall. Leaves 1.2–7.5 × 0.8–3 cm, elliptic or slightly obovate, pubescent. Flowers purplish, in 2.5–5 cm long spikes. Capsule 0.4–0.6 cm long, narrowly oblong. Seeds minute, globose or ellipsoid.

Bulsar (Abrama) in moist ground, gregarious (Patel R. M., 1971).

FLS : Sep.–Oct. *FRS :* Oct –Nov.

THELEPAEPALE Bremek.

Thelepaepale ixiocephala (Bth.) Bremek. in Verh. Ned. Akad. Wet. (II) 4:188. 1944; S 198. *Strobilanthes ixiocephalus* Bth. in Flora 33:557. 1849; FBI 4:444; C 2:448.

Small shrubs. Leaves 6–20 × 4–6 cm, opposite, elliptic–lanceolate, hairy. Flowers white or pale-blue, in axillary spikes and terminal fascicles. Capsule 1–1.3 cm long, obovoid, narrow towards base, hygroscopically hairy, margins densely so.

Dangs. Herbarium no. B. B. Joshi 301 from Baroda is also in the Blatter herbarium; rare.

THUNBERGIA Retz. nom. cons.

Key to species

1. Twining :
   2. Flowers axillary, 1–3, on 1.5–5.5 cm long peduncle; calyx 10-16-toothed; corolla white .. .. .. *T. laevis*
   2. Flowers in racemes; calyx entire or crenate; corolla pale- to bright-blue.. .. .. *T. grandiflora*

1. Erect.. .. .. *T. erecta*

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Thunbergia erecta (Bth.) T. Anders. in Journ. Linn. Soc. 7:18. 1864; C 2:418; Bailey 919; S & J 40. *Meyenia erecta* Bth. in Hk. Niger. Fl. 476. 1849.

Shrubs, 75-100 cm tall; bark dark-brown. Leaves 2.5-7.5 × 1.5-3.5 cm, elliptic, ovate-elliptic or elliptic-lanceolate, glabrous. Flowers axillary, solitary, pedunculate. Capsules not seen.

Ornamental.

FLS : Aug.-Dec.

Thunbergia grandiflora (Roxb. ex Rottl.) Roxb. in Lodd. Bot. Cab. t. 324. 1819; FBI 4:392; C 2:418; S 194. *Flemingia grandiflora* Roxb. ex Rottl. in Ges. Naturf. Fr. Neue Schr. 4:202. 1803.

An extensive, woody twiner. Leaves 8-15 × 9-12 cm, ovate or deltoid-ovate, sparsely toothed or lobed. Flowers 4.5-6 cm across, in pendulous racemes, rarely axillary, solitary. Capsule 3-5 cm long, glabrous, dark-green, at length pale-brown.

Planted at some places in gardens.

FLS & FRS : Almost for the whole year.

Thunbergia laevis Nees in Wall. Pl. As. Rar 3:77 1832; S 193. *Thunbergia fragrans* Roxb. Pl. Cor. 1:47. t. 67. 1795; FBI 4:390; C 2:417.

Twining. Leaves 5.5-13 × 2.9-9.2 cm, ovate-triangular, glabrous, entire or few toothed towards tip. Flowers white, axillary, 1-3. Capsules 2-2.5 × 0.4-0.6 cm, glabrous, basal part globose, seed bearing; beak dagger-shaped, sterile.

Wild in forests of Sanjan (Nargol) and Dangs; not common; also cultivated in botanical gardens.

FLS & FRS : Aug.-Oct.

AVICENNIACEAE 97

AVICENNIA L.

Key to species

1. Leaves obtuse at apex; stamens exerted; styles long.. .. .. .

4. Large trees; fruit enclosed in persistent, much inflated calyx.. .. ..*Tectona*

4. Shrubs or small trees, at times straggling; fruit not as above :

5. Inflorescence cymose; plants usually unarmed;

6. Stamens much exerted; fruit with four 1-seeded pyrenes.. .. ..*Clerodendrum*

6. Stamens scarcely exerted; fruit with one normally 4-celled pyrene.. .. ..*Premna*

5. Inflorescence a spike; plants armed or unarmed :

7. Spikes erect.. .. ..*Lantana*

7. Spikes drooping.. .. .. ..*Duranta*

3. Corolla distinctly 2-lipped :

8. Calyx persistent, nearly orbicular.. ..*Holmskioldia*

8. Calyx not as above.. .. ..*Gmelina*

2. Herbs :

9. Prostrate, rooting at nodes.. .. .. ..*Phyla*

9. Erect.. .. ..*Priva*

CLERODENDRUM L.

Key to species

i. Straggling or subscandent; cymes few-flowered .. *C. inerme*

1. Erect; cymes many-flowered :

2. Calyx lobes long, ovate, acuminate; leaves opposite .. .. *C. multiflorum*

2. Calyx lobes very short, broadly triangular; leaves often in whorls of 3 .. .. *C. serratum*

Clerodendrum inerme (L.) Gaertn. Fruct. 1:271. t. 75. 1788; FBI 4:589; C 2:511; WI 2:232; S & J 40; S 214. *Volkameria inermis* L. Sp. Pl. 889. 1753.

Glabrous or sparsely hairy shrubs. Leaves 1–10×0.5–3 cm, ovate-oblong, elliptic-oblong or elliptic-lanceolate, rarely obovate, glabrous or slightly pubescent on nerves beneath. Flowers white, in axillary cymes. Drupes 1–1.2 cm long, glabrous, deep-purple or nearly black, enclosed in persistent, ribbed calyx.

Throughout; common as hedges.
FLS & FRS : Throughout the year. (વારંવાર)

Clerodendrum multiflorum (Burm. f.) O. Ktze. Rev. Gen. Pl. 3:526, 1891; S & J 40. *Volkameria multiflorum* Burm. f. Fl. Ind. 137. t. 45. f. 1. 1768. *Clerodendrum phlomidis* L. f. Suppl. 292. 1781; FBI 4:590; C 2:511; WI 2:232.

A large shrub or a small tree, 2.5–4 m tall, with creamy-white to grey bark. Leaves 0.6–8.3×0.3–6.5 cm, broadly ovate, deltoid-ovate or ovate-rhomboid, rarely nearly suborbicular, thinly hairy. Flowers creamy-white, at times with a pinkish tinge, in axillary, dichotomous cymes and terminal panicles. Drupes 0.4–0.6 cm across, obovoid, glabrous or sparsely hairy.

Throughout, in hedges on plains. (ARNI)
FLS & FRS : Oct.–Feb.

Clerodendrum serratum (L.) Moon, Cat. 46. no. 382. 1824; FBI 4:592; C 2:512; WI 2:232; S 214. *Volkameria serrata* L. Mant. 90. 1767.

1.2–2 m tall shrubs. Leaves 10–27×4.5–13 cm, broadly elliptic-oblong or obovate-oblong, glabrous. Flowers bright-blue or purplish-blue, in 10–20 cm long, terminal, pyramidal panicles. Drupes 0.6–0.8 cm long, obovid, glabrous, 4-lobed.

Dangs (Malegaon-Saputara); occasional, gregarious on hilly slopes. (BHARUNGI)
FLS & FRS : June–Nov.

DURANTA L.

Duranta repens L. Sp. Pl. 637. 1753; Bailey 843; WI 3:117. f. 66; S & J 40; S 215. *Duranta plumieri* Jacq. Select. Stirp. Amer. Hist. 186. t. 176. f. 76. 1763; FBI 4:560 (in nota); C 2:518.

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Armed shrubs, 1.5–3.5 m tall, with greyish–brown fissured bark. Leaves 1.2–7.5×0.4–3.5 cm, glabrous, ovate–elliptic or oblong–lanceolate. Flowers white or pale–blue, in terminal and axillary, 4–12 cm long, drooping spikes Berries 0.4–0.7 cm long, ellipsoid, ovoid or almost spherical, orange–coloured. Seeds 4, brown, glabrous, shining.

Ornamental.

FLS & FRS : Throughout the year.

GMELINA L.

Key to species

1. Armed; flowers in pendulous racemes; bracts large, brightly coloured.. .. ..*G. philippensis*
1. Unarmed; flowers in erect panicles; bracts not as above..... .. ..*G. arborea*

Gmelina arborea Roxb. Hort. Beng. 46. 1814 (nomen) & Pl. Cor. 3:42. t. 246. 1819; FBI 4:581; C 2:504; Bor 302; WI 4:154. f 71; S & J 40; S 212.

3–18 m tall trees, with greyish–yellow, smooth bark. Leaves 5.5–36×4.8–29.5 cm, broadly ovate, fulvous–tomentose beneath. Flowers yellow, in 10–23.5 cm long, terminal panicles. Drupes 1.8–2.5 cm long, oblong, glabrous, smooth, yellow or orange when ripe. Seeds 1.5–2 cm long, ellipsoid–oblong, brown, glabrous, smooth.

Throughout; not frequent; seldom planted. (SIVAN)

FLS : Jan.–Apr. *FRS :* Apr.–May

Gmelina philippensis Cham. in Linnaea 7:109. 1832; Bor 302. *Gmelina hystrix* Schult. ex Kurz in Journ. As. Soc. Bengal 39(2): 31. 1870; FBI 4:582; C 2:505.

Straggling shrubs, 2–4 m tall, with pale– to dark–brown, lenticellate bark. Leaves 4–10.5×3–5.5 cm, entire or lobed, ovate,

ovate–rhomboid or elliptic, glabrous. Flowers yellow, in 5–10 cm long, drooping racemes. Drupes 1.4–2×1.2–1.6 cm, obovoid, orange–yellow when ripe.

Ornamental.

FLS : Sep.–Feb. *FRS :* Dec.–July .

HOLMSKIOLDIA Retz.

Holmskioldia sanguinea Retz. Obs. Bot. 6:31. 1791; FBI 4:596; C 2:518; Bailey 842; WI 5:108 f. 67.

A large, rambling shrub, 1.5–2 m tall, pubescent in younger parts. Leaves 4.3–9.5×3.3–5.5 cm, ovate or ovate–elliptic, nigro–punctate beneath. Flowers yellow, scarlet or red, in terminal panicles. Fruits not seen.

Ornamental.

FLS : July–Dec.

LANTANA L.

Key to species

1. Plants armed with recurved prickles, flowers variously coloured; leaves not lemon smelling.. .. ..*L. camara* var. *aculeata*
1. Plants unarmed; flowers lilac or white; leaves strongly lemon–smelling.. .. .. *L. salvifolia*

Lantana camara L. var. **aculeata** (L.) Mold. in Torreya 34:9. 1934; Bailey 842; WI 6:31. f. 18; Ch & O 186; S 211. *Lantana aculeata* L. Sp. Pl. 627. 1753. *Lantana camara* auct. non L.; FBI 4:562; C 2:498.

A straggling or scandent shrub, 1.5–2.5 m tall, with pale– to yellowish–brown bark. Leaves 2.5–10×2–7 cm, ovate, scabrid–pubescent. Flowers bright–pink, dark–red or orange or peripheral ones bright–pink, central ones yellow or orange, in terminal, compact, 2–3.5 cm broad spikes. Pyrenes 0.3–0.4 cm across, globose, dark–greenish–black.

Scanned by CamScanner

Throughout, everywhere; common; native of Tropical America.

FLS & FRS : Throughout the year.

Lantana salvifolia Jacq. Hort. Schoenbr. 3:18. t. 285. 1798; S & J 41. *Lantana indica* Roxb. Hort. Beng. 26. 1814 (nomen) & Fl. Ind. 3:89. 1832; FBI 4:562; C 2:499; WI 6:34.

Strongly aromatic, straggling undershrubs or shrubs. Leaves 1.5-7.2×0.6-3.1 cm, elliptic or ovate-elliptic, pubescent. Flowers lilac, in pedunculate, capitate spikes. Drupes 0.3-3.5 cm across, globose, black, glabrous.

Throughout along water courses and river banks; common.

FLS & FRS : More or less throughout the year.

PHYLA Lour.

Phyla nodiflora (L.) Greene in Pittonia 4:46. 1899; Ch & O 185; S & J 41; S 211. *Verbena nodiflora* L. Sp. Pl. 20.1753. *Lippia nodiflora* A. Rich. ex Michx. Fl. Bor. Amer. 2:15. 1803; FBI 4:563; C 2:499; WI 6:142.

Creeping, often radially spreading herbs. Leaves 0.5-2.5×0.3-1.1 cm, sessile, obovate or spathulate. Flowers white or pale-pink, in 0.5-1.5 cm long, cylindric spikes. Drupes globose, smooth, glabrous, hard, brown.

Throughout, in small or large patches, everywhere; common. (RATVELIO, RATULIO, RATOKHARAR)

FLS & FRS : Throughout the year.

PREMNA L.

Key to species

1. Leaves not more than 2 cm long .. .. .. *P. resinosa*
1. Leaves more than 2 cm long :
   2. A scandent shrub; calyx truncate.. .. ..*P. coriacea*
   2. An erect, small tree or shrub; calyx 2-lipped.. *P. integrifolia*

Premna coriacea Cl. in Hk. f. FBI 4:573. 1885; C 2:506; S 213 *Premna scandens* Grah. Cat. 155. 1839 (non Roxb. 1832).

An extensive climber, with lenticellate bark. Leaves 8-15×5-10 cm, ovate or elliptic, glabrous, coriaceous. Flowers numerous, in large, terminal, pubescent, paniculate, corymbose cymes. Drupes 0.4-0.6 cm long, obovoid, glabrous.

Listed by Thaker J I. (1926, p. 221) from Kutch. He remarks that he has not seen flowers or leaves but the dried stems, which are used as firewood, are sold in Bhuj. According to him it is common in hills of Kutch.

Premna integrifolia L. Mant. 2:252. 1771; FBI 4:574; C 2:506. *Cornutia corymbosa* Burm. f. Fl. Ind. 132. t. 141. 1768. *Premna corymbosa* auct. non Rottl. & Willd. 1803. *Premna obtusifolia* R. Br. Prodr. 512. 1810; WI 8:240; S & J 41.

Sarmentose shrubs. Leaves 6.2-10.5×3.7-7 cm, broadly elliptic, elliptic-oblong, obovate-oblong or elliptic-lanceolate, hairy. Flowers greenish-white in paniculate cymes. Drupe 0.4-0.6 cm across, broadly obovoid or nearly spherical, dark-brown or almost black when dry.

Kutch and Saurashtra.

FLS & FRS : July-Nov.

Premna resinosa Schau in DC. Prodr. 6:637. 1836; Jain & Kanodia in Curr. Sci. 29:361-362. 1960; S & J 41.

Slender shrubs; bark greyish-white, smooth in younger parts. Leaves 0.6-1.8×0.4-1.2 cm, broadly ovate, coriaceous, glabrous. Flowers white, in terminal cymes. Drupes nearly globose.

Kutch and Saurashtra; not common.

FLS & FRS : Aug.-Oct.

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PRIVA Adans.

Priva cordifolia (L. f.) Druce in Rep. Exch. Cl. Brit. Isles 641. 1916 (1917); S & J 41; WI 8:245. *Buchnera cordifolia* L. f. Suppl. 287. 1781. *Priva leptostachya* Juss. in Ann. Mus. Par. 7:70. 1806; FBI 4:565; C 2:502.

Erect herbs, 30–50 cm tall. Leaves 1.8–8×0.8–4 cm, ovate to ovate-oblong, appressed-hairy. Flowers white, in terminal, 10–40 cm long racemes. Pyrenes 0.3–0.5 cm broad, obovate-oblong, reticulately pitted or echinate on back, deeply excavated on faces.

Saurashtra, rare.

FLS & FRS : Oct.

TECTONA L. f. nom. cons.

Tectona grandis L. f. Suppl. 151. 1781; FBI 4:570; C 2:503; Bor 302; Ch & O 186; S & J 41.

Deciduous trees with straight trunk and pale-brown, rough bark. Leaves 10–45×5–13 cm, coriaceous, rough, stellately tomentose. Flowers white or pale-blue, in terminal panicles. Drupes subglobose, somewhat 4-lobed, stellately hairy. Seeds ellipsoid-oblong, glabrous, reticulate.

Throughout in deciduous forest (except some parts of Banaskantha and Rajkot districts); common. (SAG, SAGVAN)

FLS & FRS : Aug.–Dec.

VITEX L.

Key to species

1. Leaves 3- & 5-foliolate; leaflets petioluled, lanceolate or ovate .. .. *V. negundo*
1. Leaves 3 (5)-foliolate and simple mixed; leaflets sessile, obovate-oblong.. .. .. *V. trifolia*

Vitex negundo L. Sp. Pl. 638. 1753; FBI 4:583; C 2:508; Bailey 844; Bor 305; Ch & O 187; S & J 41.

Large shrubs or small trees, with light-blackish-brown, longitudinally fissured bark. Leaflets 3–11.5×1–2.8 cm, grey-tomentose beneath. Flowers white or blue or bluish-purple, in 8–20 cm long, terminal panicles. Drupes dark-purple to almost black, glabrous, nearly globose.

Throughout, in river beds and waste places; common; occasionally cultivated. (NAGOD, NAGUD, NARGUND, NIGODZO ZAD)

FLS & FRS : Throughout the year.

Vitex trifolia L. Sp. Pl 638. 1753; FBI 4:583; C 2:508.

This species is listed by Thaker et al. (1926, p. 224) from Kutch.

LAMIACEAE (LABIATAE)

Key to genera

1. Plants with suckers.. .. ..*Mentha*
1. Plants without suckers :
2. Perfect stamens 4 :
3. Stamens declinate; anther cells at length confluent :
4. Leaves pinnatisect.. .. .. .. *Lavandula*
4. Leaves not pinnatisect :
5. Lower lip of corolla somewhat declinate, flat or slightly concave, generally narrower but hardly longer than the usually 4-lobed upper lip :
6. Fruiting calyx deflexed, the upper lobe widest, large, ovate, recurved :
7. Corolla-tube short, lower lip flat; stigma 2-fid .. .. *Ocimum*
7. Corolla tube usually long; lower lip concave; stigma entire.. .. ..*Orthosiphon*
6. Fruiting calyx, suberect or declinate, upper lobe broader than others :

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8. Whorls crowded in terminal and axillary, compact, globose or ovoid heads.. .. .. *Acrocephalus*

8. Whorls laxly racemose .. *Moschosma*

5. Lower lip of corolla deflexed, concave, boat-shaped or saccate, much longer than upper lip :

9. Upper lip of corolla very short, obtusely 3–4-toothed; lower lip much elongated, boat shaped :

10. Calyx equally 5-toothed or somewhat 2-lipped, 3+2, with upper lobe large, rounded, reflexed, others narrow subulate; inflorescence racemose :

11. Filaments free .. .. *Plectranthus*

11. Filaments connate ... .. *Coleus*

10. Calyx very oblique, 2-lipped, upper lip large, entire, inflexed, closing the mouth, lower lip truncate, 4-toothed or 1-lipped, slit in front, the solitary lip 5-toothed, incurved but not quite closing the calyx mouth; inflorescence compact spike.. .. .. .. *Anisochilus*

9. Corolla obscurely 2-lipped, two upper lip 4-lobed, two lobes flat, similar and subequal to two laterals, all about as long as abruptly deflexed, saccate lower lip .. .. *Hyptis*

3. Stamens erect or spreading; anther cells free :

12. Corolla lobes 4; stamens equal or subequal :

13. Calyx 5-toothed, not plumose; stamens exerted.. .. .. *Pogostemon*

13. Calyx 5-partite, segments plumose; stamens not exerted.. .. .. .. *Colebrookea*

12. Corolla 2-lipped; stamens didynamous :

14. Flowers orange-coloured .. .. *Leonotis*

14. Flowers white, blue, bluish-purple or creamy-yellow :

15. Corolla hooded .. .. *Leucas*

15. Corolla not hooded :

16. Calyx 5–10-nerved; lower pair of stamens longer; plants more than 60 cm tall.. .. .. *Anisomeles*

16. Calyx 15-nerved; upper pair of stamens longer; plants not more than 60 cm tall .. .. *Nepeta*

2. Perfect stamens 2 .. .. *Salvia*

ACROCEPHALUS Bth.

Acrocephalus indicus (Burm. f.) O. Ktze. Rev. Gen. Pl. 2:511. 1891; S & J 41; S 216. *Prunella indica* Burm. f. Fl. Ind. 130. 1768. *Ocimum capitatum* L. f. Suppl. 276. 1781. *Acrocephalus capitatus* (L. f) Bth. in Wall. Pl. As. Rar. 2:18. 1831; FBI 4:611; C 2:525.

Slender, annual, 10–35 cm tall herbs. Leaves 1.2–3.5×0.4–1.3 cm, ovate to elliptic or ovate-lanceolate. Flowers bluish-purple, in terminal, subcylindric or globose heads. Nutlets oblong-ellipsoid, smooth.

Throughout (except Kutch), among grasses.

FLS & FRS: Aug.–Dec.

ANISOCHILUS Wall.

Anisochilus carnosus Wall. Pl. As. Rar. 2:18. 1831; FBI 4:627; C 2:532; WI 1:79; S & J 41.

50–70 cm tall, stout herbs. Leaves 2.5–4.5×2–3.6 cm, ovate, pubescent beneath. Flowers pale-purple, in dense, cylindric spikes. Nutlets smooth, brown, suborbicular.

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Saurashtra and Chhotaudepur; rare (ઉભો રાખેલાઓ)

FLS & FRS : Sep. Idargadh

ANISOMELES R. Br.

Key to species

1. Stem and branches acutely quadrangular, not woolly :
   2. Plants glabrous; flowers 1–1.2 cm long, white or creamy –white, purple tinged on lower lip.. .. .. *A. heyneana*
   2. Plants densely pubescent; flowers 1.6–1.8 cm long, reddish –purple.. .. .. *A. indica*
1. Stem and branches obtusely quadrangular, densely woolly.. .. .. *A. malabarica*

Anisomeles heyneana Bth. in Wall. Pl. As. Rar. 1:59. 1830; FBI 4:672; C 2:543; Ch & O 191; S 219.

60–150 cm tall herbs or undershrubs, thinly pubescent in younger parts. Leaves 3.5–17 × 1.2–7.8 cm, ovate, ovate-oblong or ovate-lanceolate, glabrous or sparsely hairy. Racemes 6–30 cm long, axillary and terminal. Nutlets oblong, brown, smooth.

Dangs, Vyara, Rajpipla, Pavagadh and Chhotaudepur, rare.

FLS & FRS : Sep.–Dec.

Anisomeles indica (L.) O. Ktze. Rev. Gen. Pl. 512. 1891; WI 1:79; Ch & O 190; S & J 41. *Nepeta indica* L. Sp Pl. 571. 1753. *Anisomeles ovata* R. Br. in Ait. Hort. Kew. (ed. 2) 3:364 1811; FBI 4:672; C 2:543.

0.6–1.4 m tall undershrubs or shrubs. Leaves 2.9–12.5 × 1.6–9 cm, ovate, softly pubescent, petiolate. Flowers in dense, sessile cymes, forming 2.5–10 cm long, interrupted, terminal and axillary spikes. Nutlets 0.15–0.2 cm long, broadly ovoid, obtusely angled, black, shining.

Throughout, a road side weed. (CHODHARO)

FLS & FRS : Oct.–Apr.

Anisomeles malabarica R. Br. ex Sims, Bot. Mag. t. 2071. 1819; FBI 4:673; C 2:544; WI 1:79; S & J 41.

1.2–2 m tall shrubs. Leaves 4.7–9.5 × 1.5–4 cm, lanceolate, ovate-lanceolate or oblong-lanceolate, villous. Flowers purple, in compact whorls, arranged in interrupted, terminal and axillary, 10–25 cm long, spicate racemes. Nutlets ellipsoid, trigonous, compressed, brown, smooth and polished on dorsal, round surface.

Saurashtra (RUNCHHALO CHODHARO)

FLS : Nov.–Dec.

COLEBROOKEA Sm.

Colebrookea oppositifolia Sm. Exot. Bot. 2:111. t. 115. 1805; FBI 4:642; C 2:541; WI 2:308; S 218. *Colebrookea tenifolia* Roxb. Pl. Cor. 3:40. t. 245. 1819.

1.8–4 m tall, grey-tomentose shrubs. Leaves 7–22 × 2.4–7 cm, opposite or ternate, oblong-lanceolate or oblanceolate, pubescent. Flowers white, minute, numerous, in axillary and terminal, 3–10 cm long, paniculate spikes. Nutlets oblong-obovoid, pubescent

Dangs (Malegaon–Saputara ghat road); common.

FLS : Nov.–Dec. *FRS :* Jan.–Mar.

COLEUS Lour.

Coleus forskohlii (Poir.) Briq. in Engl. & Prantl, Pflam. 4(3a) : 359. 1897; WI 2:308. *Germania forskohlii* Poir. Dict. 2 : 764. 1786. *Coleus barbatus* Bth. in Wall. Pl. As. Rar. 2:15. 1831; FBI 4:625; C. 2:530; S & J 41.

30–80 cm tall, erect, perennial herbs, villous at least in younger parts. Leaves 4.5–9 × 0.6–4.8 cm, ovate to ovate-elliptic, villous beneath. Flowers purple or purplish-blue, in verticels, arranged terminally, in 10–30 cm long, interrupted spike-like racemes. Nutlets nearly globose, black, smooth, glabrous.

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Dangs (Saputara), on hilly slopes; rare but locally abundant; also from Saurashtra. (ESIDIA).

FLS & FRS : Sep.–Oct.

HYPTIS N. J. Jacq. nom. cons.

Hyptis suaveolens (L.) Poit. in Ann. Mus. Par. 7:472. t. 29. f. 2. 1806; FBI 4:630; C 2:560; WI 5:159. f 101; S & J 41. *Bellota suaveolens* L. Syst. (ed. 10) 1100. 1759.

Densely but softly hairy herbs, 60–100 cm tall. Leaves 2.5–13×1.5–10 cm, broadly ovate, thinly to densely hairy. Flowers blue, in axillary and terminal whorls often forming lax panicles. Nutlets blackish-brown, obovoid, cuneate, emarginate at apex.

Throughout, often gregarious, but not common; native of Tropical America.

FLS & FRS : Aug.–Feb.

LAVANDULA L.

Lavandula bipinnata (Roth) O. Ktze. Rev. Gen. Pl. 521. 1891; WI 5:44; S & J 41. *Bisteropogon bipinnatus* Roth, Nov. Pl. Sp. 255. 1821. *Lavandula burmanni* Bth. Lab. Gen. et Sp. 151. 1833 & in DC. Prodr. 12:147. 1848; FBI 4:631; C 2:534.

40-90 cm tall, hoary-pubescent, erect herbs. Leaves 3–10 cm long, pinnatisect, segments linear or linear-lanceolate, appressed-pubescent. Flowers blue, in 1.3–5 cm long, simple or branched, axillary and terminal spikes. Nutlets 0.1–0.15 cm long, brown, oblong.

Dangs, Chhotaudepur, Saurashtra, among grasses; common to occasional

FLS : Oct.–Dec. *FRS :* Nov.–Feb.

LEONOTIS R. Br.

Leonotis nepetifolia (L.) R. Br. in Ait. Hort. Kew. (ed. 2) 3: 409. 1811; C 2:555; WI 5:66. f. 26; Ch & O 192. *Phlomis nepetifolia* L. Sp. Pl. 586. 1753.

Stout, deciduous, 1–2.5 m tall herbs. Leaves 1.5–12×0.8–7 cm, ovate or lanceolate, finely pubescent. Flowers 2.5–3 cm long, in 4–6 cm broad, globose, axillary whorls. Nutlets oblong–obovoid, brown, obliquely truncate at apex.

Throughout (except Kutch and Saurashtra), in plains; occasional.

FLS & FRS : Dec.–Feb

LEUCAS R. Br.

Key to species

1. Calyx mouth oblique :
   2. Mouth of calyx much produced below.. .. *L. urticaefolia*
   2. Mouth of calyx produced above :
      3. Calyx teeth very long and slender :
         4. Lower lip of corolla slightly longer than the upper lip; tube annulate within. .. .. .. *L. nutans*
         4. Lower lip of corolla twice as long as upper; tube not annulate within .. .. .. *L. martinicensis*
      3. Calyx teeth very short :
         5. Calyx mouth not villous within :
            6. Calyx smooth below, ribbed and hispid above .. .. *L. aspera*
            6. Calyx smooth throughout, not hispid .. .. *L. lavandulaefolia*
         5. Calyx mouth villous within :
            7. Leaves linear, entire; flower whorls less than 2.5 cm broad .. .. *L. zeylanica*
            7. Leaves ovate, crenate; flower whorls usually more than 2.5 cm across .. .. *L. cephalotes*
1. Calyx mouth straight or nearly so :
   8. Calyx teeth stellately spreading .. .. .. *L. stelligera*
   8. Calyx teeth erect :

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9. Flowers 1-4 in a whorl .. ..*L. biflora*

9. Flowers 9-many in a whorl ;

10. Whorls terminal; calyx teeth long, unequal.. .. .. *L. stricta*

10. Whorls axillary; calyx teeth very short..*L. longifolia*

Leucas aspera (Willd.) Spr. Syst. 2:743 1825; FBI 4:690; C 2:548; WI 6:79; Ch & O 191; S & J 41. *Phlomis aspera* Willd. in Link, Enum. Hort. Berol. 2:113. 1809.

Densely hairy, erect herbs. Leaves 1-9×0.8-4.5 cm, linear, elliptic or elliptic-lanceolate, appressed-hairy. Flowers white, many, in axillary and terminal, globose whorls Nutlets black, oblong, smooth, glabrous.

Throughout; common and abundant. (KUBI)

FLS & FRS : Throughout the year.

Leucas biflora R. Br. Prodr. 504. 1810; FBI 4:683; C 2:553; Ch & O 192.

Slender, procumbent or straggling, hairy herbs. Leaves 1-5.5×0.5-1.8 cm, ovate, elliptic or elliptic-oblong, pubescent. Flowers white, 1-4, in axillary whorls. Nutlets light-black, obtusely trigonous, oblong-obovoid, truncate at apex.

North to south Gujarat; not common.

FLS & FRS : Sep.-Feb.

Leucas cephalotes (Roxb. ex Roth) Spr. Syst. 2:743. 1825; FBI 4:689; C 2:549; WI 6:79; S & J 41. *Phlomis cephalotes* Roxb. Hort. Beng. 46. 1814 (nomen) ex Roth, Nov. Pl. Sp. 262. 1821.

Appressed-pubescent, 20-50 cm tall, erect annuals. Leaves 1.2-6.5×0.7-2.7 cm, ovate to ovate-lanceolate, appressed-hairy. Flowers white, in 2-4.5 cm across, globose whorls. Nutlets obovoid-oblong, glabrous, dark-brown.

Throughout, scattered; occasional. (KHETARAU KUBO, DOSINOKUBO)

FLS & FRS : Aug.-Feb.

Leucas lavandulaefolia J. E. Sm. in Rees, Cyclop. 20 : no 2. 1812; WI 6:80; S & J 41; S 219. *L. linifolia* Spr. Syst. 2:743. 1825; FBI 4:690; C 2:548.

30-40 cm tall herbs. Leaves 2.5-10×0.6-1.5 cm, linear-lanceolate, appressed-pubescent, at length nearly glabrous. Flowers white, in axillary and terminal whorls towards ends of branches. Nutlets minute, brown, oblong, rounded on back, sharply angular on inner face.

Saurashtra and Kutch (ZINA PANNO KUBO)

FLS & FRS : Monsoon.

Leucas longifolia Bth. Lab. Gen. & Sp. 744. 1835; FBI 4:684; C 2:551; S & J 41.

Erect, rigid, hispid herbs, 15-30 cm tall. Leaves 1-5.5×0.5-1 cm, linear, pubescent, sessile. Flowers white, in axillary and terminal whorls. Nutlets trigonous, obovoid-oblong

Saurashtra, north Gujarat (Mahudi), Panchmahals; on the whole a rare plant.

FLS & FRS : Oct.-Dec.

Leucas martinicensis (Jacq.) R. Br. Prodr. 504. 1810; FBI 4:688; C 2:550; WI 6:80. *Clinopodium martinicense* Jacq. Amer. Hist. 173. 1763.

Erect, simple or branched, 45-75 cm tall, hairy herbs. Leaves 5-9×1-1.6 cm, ovate to ovate-lanceolate, densely appressed-hairy. Flowers white, in 1.5-2.5 cm broad, globose, axillary and terminal whorls. Nutlets black, obovoid-oblong, obtusely trigonous, truncate at apex.

Bulsar, Dangs, Rajpipla, Chhotaudepur and Panchmahals; on the whole rare.

FLS & FRS : Aug.-Dec.

Leucas nutans (Roth) Spr. Syst. 2:743. 1825; FBI 4:688; C 2:550. *Phlomis nutans* Roth, Nov. Pl. Sp. 263. 1821.

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Straggling herbs. Leaves 1.2–5.5×0.5–1.2 cm, lanceolate or oblong-lanceolate, pilose. Flowers white, in whorls. Nutlets minute, light-blackish-brown, oblong-obovoid or trigonous, smooth, glabrous.

Rajpipla and north Gujarat (Ahmedabad); not frequent.

FLS & FRS : Oct.-Jan.

Leucas stelligera Wall. ex Bth. in Wall. Pl. As. Rar. 1:61. 1830; FBI 4:686; C 2:553; WI 6:80; Ch & O 191; S & J 41; S 219.

Erect herbs, softly villous, 45–60 cm tall. Leaves 4.5–8×1–3 cm, elliptic-lanceolate or oblong-lanceolate, pilose. Flowers white, sessile, numerous, in terminal and axillary whorls. Nutlets oblong-ovoid, rounded on dorsal surface, angular on inner surface, smooth, brown.

Saurashtra and Pavagadh; rare. (DUNGARAU KUBO)

FLS & FRS : Aug.–Sep.

Leucas stricta Bth in Wall. Pl. As. Rar. 1:61. 1832 & Lab. Gen. & Sp. 744. 1836. FBI 4:688; C 2:551; S 219.

20–45 cm tall annuals. Leaves 2.5–5 cm long, linear to linear-oblong, hispid. Flowers white, in terminal whorls. Nutlets smooth, brown, oblong-obovoid or trigonous.

Broach, Chhotaudepur and north Gujarat (Talod); rare.

FLS & FRS : Oct.-Jan.

Leucas urticaefolia R. Br. Prodr. 504. 1810; FBI 4:680; C 2:547; WI 6:81.

Annual herbs, erect. Leaves 1.5-6.5×0.9-3.5 cm, broadly ovate to ovate-elliptic, pubescent. Flowers white, in dense, axillary whorls. Nutlets minute, smooth, glabrous, oblong-obovoid or trigonous.

Throughout; common. (KUBO)

FLS & FRS : Aug.-Oct.

Leucas zeylanica R. Br. Prodr. 504. 1810; FBI 4:689; C 2:549.

Annual, erect, 15–30 cm tall herbs. Leaves 2-6×0.7–1 cm, linear. Flowers white, in terminal whorls. Nutlets obovoid-oblong, trigonous.

North Gujarat (Mahudi), on sandy river bed; rare.

FLS & FRS : Nov.-Jan.

MENTHA L.

Mentha spicata L. Sp. Pl. 576 1753; Bailey 863; WI 6:344; Maheshwari Fl. Delhi 286. 1963. *Mentha viridis* L. Sp. Pl. (ed. 2) 804. 1763; FBI 4:647; C 2:559.

Aromatic, perennial, creeping or ascending herbs. Leaves 3–4×2–3 cm, glabrous, ovate, ovate-elliptic or elliptic-oblong, rugose.

Cultivated. (FUDINO)

FLS : Not seen.

MOSCHOSMA Reichb.

Moschosma polystachyum (L.) Bth. in Wall. Pl. As. Rar. 2:13. 1831; FBI 4:612; C 2:527; WI 6:439; Ch & O 190. *Ocimum polystachyon* L. Mant. 2:567. 1771.

Annual, erect, 20–50 cm tall herbs. Leaves 1.2-6×0.5–3 cm, ovate to broadly ovate-lanceolate, glabrous. Flowers pale-to bright-purple, in 3–5 cm long, axillary and terminal racemes. Nutlets smooth, glabrous, ellipsoid, brown.

Throughout in plains. (DUNGRAU TULSI; ABCHI-BAVCHI)

FLS & FRS : Sep.-Jan.

NEPETA L.

Key to species

1. Calyx teeth not aristate .. .. *N. bombaiensis*

1. Calyx teeth aristate :

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2. Calyx upto 0.4 cm long; corolla exerted .. .. *N. hindostana* var. *hindostana*

2. Calyx 0.6-0.8 cm long; corolla scarcely exerted.. .. .. *N. hindostana* var. *woodrowii*

Nepeta bombaiensis Dalz. in Dalz. & Gibs. Bomb. Fl. 209. 1861; FBI 4:661; C 2:556; Ch & O 193; S & J 42.

Pilose herbs, upto 30 cm tall. Leaves 1-1.2×0.6-0.8 cm, pubescent, rotund-ovate. Flowers purple, 6-8, in axillary, pedunculate cymes. Nutlets minute, narrowly ellipsoid, dark-brown.

Reported by Chavan & Oza (1966) from Pavagadh, on the authority of Phatak & Joshi; also from Saurashtra; on old walls.

FLS & FRS : July-Aug.

Nepeta hindostana (Heyne ex Roth) Haines var. **hindostana**. *Nepeta hindostana* (Heyne ex Roth) Haines, Bot. Bihar & Orissa 4:744. 1922; Ch & O 192; WI 6:13. f. 7. *Glechoma hindostana* Heyne ex Roth, Nov. Sp. Pl. 258. 1821. *Nepeta ruderalis* Buch.-Ham. ex Hk. f. in Hk. f. FBI 4:661 1885; C 2:556.

Softly pubescent annuals. Leaves 1.5-3.5×0.8-3 cm, broadly ovate or suborbicular, pubescent. Flowers blue or bluish-purple, in verticels arranged in axillary cymes. Nutlets oblong-ellipsoid, brown, smooth, with white spots.

Frequent on old walls at Pavagadh.

FLS : Aug.-Feb. *FRS* : Sep.-Feb.

Nepeta hindostana (Heyne ex Roth) Haines var. **woodrowii**. (Cooke) Santapau, Fl. Purandhar 110. 1958. *Nepeta ruderalis* Buch.-Ham. ex Hk. f. var. *woodrowii* Cooke, Fl. Pres. Bombay 2:473. 1906 & 2:556. 1958 (reprinted).

Erect or suberect, 30-50 cm tall herbs. Leaves 1.7-4.5× 1.2-3.8 cm, broadly ovate or suborbicular, pubescent. Flowers

bluish-purple, in axillary cymes, culminating into termina., interrupted racemes. Nutlets oblong-ellipsoid, brown, smooth.

Chhotaudepur (Kadipani-Hampheshwar); very rare.

FLS & FRS : Nov.-Dec.

OCIMUM L.

Key to species

1. Corolla pale-greenish-yellow.. .. .. .. *O. gratissimum*

1. Corolla white, pink or light-purple :

2. Calyx glabrous within .. .. *O. sanctum*

2. Calyx hairy within :

3. Fruiting calyx upto 0.3 cm long; corolla upto 0.6 cm long.. .. .. *O. canum*

3. Fruiting calyx upto 0.6 cm long; corolla 1-1.2 cm long .. .. *O. basilicum*

Ocimum basilicum L. Sp. Pl. 597. 1753; FBI 4:608; C 2:522; Bailey 865; WI 6:81. f. 33; S & J 42. *Ocimum americanum* L. Cent. Pl. 1:15. 1755. *Ocimum basilicum* L var. *thyrsiflora* Bth. Lab. Gen. & Sp. 5. 1833; C 2:523.

Aromatic, 30-80 cm tall herbs. Leaves 1-7×0.3-3 cm, elliptic-lanceolate, glabrous. Flowers white, in compact or distant whorls, in terminal, simple or branched racemes. Nutlets ellipsoid or oblong, glabrous, punctate.

Cultivated; also as an escape. (DAMRO, DAMARVO, SABJO, MARUO)

FLS & FRS : Throughout the year.

Ocimum canum Sims in Bot. Mag. t. 2452. 1824; FBI 4:607; C 2:521; WI 7:79. f. 12; S & J 42; S 216. *Ocimum americanum* auct. non L. 1755; Ch & O 189; WI 79. f. 32.

Aromatic herbs, 20-45 cm tall. Leaves 1.5-7× 0.6-2.2 cm, ovate-elliptic, elliptic-oblong, or elliptic-lanceolate, glabrous or

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nearly so. Flowers white or pink, in distant whorls, in 6-20 cm long, terminal racemes. Nutlets blackish-brown, oblong or ellipsoid, glabrous, minutely punctate.

Throughout; common everywhere. (RAN TULSI, JUNGLI TULSI, TUKMARIA, JUNGLI MARUVO, NASBO)

FLS & FRS : Throughout the year.

Ocimum gratissimum L. Sp. Pl. 1197. 1753; FBI 4:608; C 2:522; Ch & O 189; WI 6:84; S & J 42.

Perennial, erect, 45–100 cm tall undershrubs. Leaves 2–14·5 × 1–7 cm, elliptic-lanceolate, pubescent or glabrescent. Flowers in compact whorls, forming 8–20 cm long racemes. Nutlets subglobose, rugose, brown.

Throughout in plains; not common. (RAMTULSI, MALA TULSI)

FLS & FRS : Aug.–Jan.

Ocimum sanctum L. Mant. 1:85. 1767; FBI 4:609; C 2:521; Ch & O 189; WI 6:87. f. 35.

Perennial 30–90 cm tall, woody herbs. Leaves 1.2-4 × 0.7–2 cm, ovate, ovate-oblong, hairy. Flowers pale-pink to pinkish-purple, in compact whorls, in terminal and axillary racemes. Nutlets broadly ellipsoid, smooth brown.

Cultivated or an escape. (TULSI)

FLS & FRS : Throughout the year.

ORTHOSIPHON Bth.

Key to species

1. Corolla tube nearly equalling the calyx .. *O. pallidus*
1. Corolla tube longer than the calyx .. .. *O. glabratus*

Orthosiphon glabratus Bth. in Wall. Pl. As. Rar. 2:14. 1831; WI 7:110. *Orthosiphon tomentosus* Bth. var. *glabratus* (Bth.) Hk. f. in Hk. f. FBI 4:614. 1885; C 2:524.

Erect herbs or undershrubs, 25–75 cm tall. Leaves 1-10.5 × 0.5-5 cm, ovate, glabrous but for puberulous nerves. Flowers white, often tinged purple, whorled, arranged in 4–20 cm long racemes. Nutlets subglobose or ellipsoid, brown, nearly smooth or minutely tuberculate.

Broach (Kadod); very rare.

FLS & FRS : Oct.

Orthosiphon pallidus Royle, MSS. ex Bth. in Hk. Bot. Misc. 3:370. 1833; FBI 4:613; C 2:523; S & J 42.

Suffrutescent herbs, with finely pubescent branches. Leaves 3-10 × 1.5–6.2 cm, glabrous, ovate. Flowers white or pale-lilac, in 10–15 cm long, terminal racemes. Nutlets subglobose, smooth, yellowish-brown.

Saurashtra.

FLS & FRS : June–Oct.

PLECTRANTHUS L' Her. nom. cons.

Key to species

1. Fruiting calyx distinctly two-lipped; upper lip broad, rounded .. .. *P. mollis*
1. Fruiting calyx indistinctly two-lipped, shortly, subequally 5-toothed .. .. *P. stocksii*

Plectranthus mollis (Ait.) Spreng. Syst. 2:690. 1825; WI 7:159. f. 54; S 216. *Ocimum molle* Ait. Hort. Kew. 2:322. 1789. *Plectranthus incanus* Link, Enum. Hort. Berol. 2:120. 1822; FBI 4:621; C 2:529.

30–70 cm tall, erect herbs. Leaves 5–12.8 × 3.2–9.5 cm, broadly ovate, sparsely pubescent. Flowers light-purple or lilac or sometimes tinged bluish, whorled, in 7-22 cm long racemes. Nutlets subglobose or broadly oblong, pale-brown or grey spotted purple, smooth.

Dangs; common, at times gregarious.

FLS : Aug.–Oct. *FRS :* Sep.–Dec.

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Plectranthus stocksii Hk. f. in Hk. f. FBI 4:618. 1885; C 2:528; Ch & O 190.

An erect herb, 30–45 cm tall. Leaves 3–6×2.5–3 cm, ovate, glabrous or sparsely hairy. Flowers whitish, whorled, arranged in terminal panicles. Nutlets broadly ellipsoid, smooth, yellowish-brown.

Pavagadh (near Machi); gregarious.

FLS & FRS : Sep.

POGOSTEMON Desf.

Key to species

1. Stem glabrous, polished; calyx teeth much shorter than the calyx tube.. .. .. *P. parviflorus*
1. Stem hoary-pubescent or villous, not polished; calyx teeth nearly equalling the calyx tube.. .. .. *P. purpurascens*

Pogostemon parviflorus Bth. in Wall. Pl. As. Rar. 1:31. 1830; FBI 4:632; C 2:536; WI 7:182. f. 65.

Shrubs 1–2 m tall, often with purplish branches. Leaves 3.5–18×1.5–12.5 cm, ovate. Flowers pale- to bright-pink, in terminal and axillary panicles. Nutlets ellipsoid, trigonous, smooth, shining.

Dharampur, Dangs, Rajpipla and Chhotaudepur; not very common.

FLS : Nov.–Mar. *FRS :* Dec.–May

Pogostemon purpurascens Dalz. in Hk. Kew Journ. Bot. 2:337. 1850; FBI 4:632; C 2:537; WI 7:183; S 217.

An erect, softly patently pubescent herb or undershrub. Leaves 5.5–18×3–11 cm, membranous, ovate or ovate-elliptic, hairy. Flowers white, whorled, in 5–25 cm long, terminal, simple or compound, villous spikes. Nutlets ovoid, compressed, obtusely trigonous, smooth and polished on rounded, dorsal surface.

Dangs (Mahal, Malegaon-Saputara, Subir) and Rajpipla (Dediapada); occasional to rare.

FLS & FRS : Oct.–Jan.

SALVIA L.

Key to species

1. Erect; leaves more than 2.5 cm long; calyx not villous; upper lip of calyx entire.. .. ..*S. plebeia*
1. Straggling; leaves upto 2 cm long; calyx villous; upper lip of calyx 3–5 toothed.. .. .. .. *S. santolinaefolia*

Salvia plebeia R. Br. Prodr. 501. 1810; FBI 4:655; C 2:557; WI 9:198.

Stout herbs, 15–60 cm tall. Leaves 0.8–7.5×0.3–2.6 cm, ovate-oblong, elliptic-oblong or oblong-lanceolate, appressed-hairy. Flowers pale-blue or nearly white, in 6–12.5 cm long, terminal and axillary racemes. Nutlets ovoid, smooth, glabrous.

Throughout (except Kutch), in drying moist places; common.

FLS & FRS : Dec.–Mar.

Salvia santolinaefolia Boiss. Diagn. Pl. Orient. 1:13. 1842 & Fl. Orient. 4:632. 1879; FBI 4:656; S & J 42; WI 9:196. *Salvia pumila* Bth. in DC. Prodr. 12:456. 1848. *Salvia aegyptiaca* L. var. *pumila* Hk. f. in Hk. f. FBI 4:656. 1885; C 2:558.

Hispid undershrubs. Leaves 0.4–2×0.2–0.5 cm, linear-lanceolate, rugose, appressed-hairy. Flowers white, few, whi in 8–10 cm long racemes. Nutlet brown, smooth, glabrous, ov

Rajpipla, Chhotaudepur, north Gujarat, Saurashtra and Kutch; rare.

FLS & FRS : Aug.–Feb.

PLANTAGINACEAE

PLANTAGO L.

Key to species

1. Leaves radical .. .. *P. ovata*
1. Leaves cauline .. .. *P. psyllium*

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Plantago ovata–Forsk. Fl. Aegpt.-Arab. 31 1775; FBI 4:707; C 2:562; WI 8:148. f. 51.

Erect, annual, 10-20 cm tall herbs. Leaves 5-15 cm long, narrowly linear, softly hairy. Spikes 1.5-4 cm long, ovoid or cylindric, at tip of 5-16 cm long scape. Capsule ellipsoid, 2-seeded, glabrous. Seeds ovoid-oblong, boat-shaped, smooth.

Cultivated in some parts of north Gujarat. (GHODA JIRU, ISABGOL)

FLS & FRS : Jan.-Feb.

Plantago psyllium L. Sp. Pl. 167. 1753; FBI 4:707; Chohan & Shah in Journ. Bomby nat. Hist. Soc. 62:327. ff. 1-4. 1965; WI 8:153. f. 53.

Erect, annual, 10-20 cm tall, finely glandular-pubescent herbs. Leaves almost filiform, glabrous. Spikes 1-1.5 cm long, ovoid, on 2.5-5 cm long, axillary peduncle. Capsule ellipsoid, glabrous. Seeds minute, boat-shaped.

North Gujarat (Mansa) and central Gujarat (Vallabh Vidyanagar), a weed in cultivated fields and wasteplaces; not frequent. (JIRALO)

FLS & FRS : Jan.-Mar.

NYCTAGINACEAE

Key to genera

1. Flowers 2-sexual :
   2. Plants wild .. .. *Boerhavia*
   2. Plants cultivated :
      3. Climbing, thorny shrubs .. .. *Bougainvillea*
      3. Undershrubs, erect, unarmed .. .. *Mirabilis*
1. Flowers 1-sexual .. .. *Pisonia*

BOERHAVIA L.

Key to species

1. Fruits glandular along the ribs only :
   2. Flowers sessile or subsessile; stamens included; opposite pairs of leaves unequal; leaves often whitish-tomentose beneath .. .. *B. diffusa*
   2. Flowers pedicellate; stamens exerted; opposite leaves nearly equal; leaves glabrous or thinly pubescent beneath .. .. *B. chinensis*
1. Fruits with large glands at crown .. .. *B. verticillata*

Boerhavia chinensis (L.) Druce in Rep. Bot. Exch. Cl. Brit. Isles 3:415. 1914; S & J 42. *Valeriana chinensis* L. Sp. Pl. 33. 1753. *Boerhavia repanda* Willd. Sp. Pl. 1:22. 1797; FBI 4:709; C 2:564.

Straggling or subscandent, perennial herbs. Leaves 1.5-8× 1-5.5 cm, deltoid-ovate, glabrous or thinly pubescent. Flowers bright-pink, 3-8, umbellate. Fruits 0.4-0.6 cm long, clavate, faintly ribbed.

Throughout, in hedges; common.

FLS & FRS : More or less throughout the year.

Boerhavia diffusa L. Sp. Pl. 3. 1753; C 2:563; WI 1:199; Ch & O 194; S & J 42; S 220. *Boerhavia repens* L. Sp. Pl. 3. 1753; FBI 4:709. *Boerhavia repens* L. var. *diffusa* Hk. f. FBI 4:709. 1885.

Diffuse, nearly glabrous herbs. Leaves 1-5.3×0.5-3.5 cm, broadly ovate, elliptic-oblong or suborbicular. Flowers minute, in umbels, forming axillary and terminal, corymbose panicles. Fruits minute, clavate, 5-ribbed.

Throughout; common and abundant. (SATODI)

FLS & FRS : Throughout the year.

Boerhavia verticillata Poir. Encycl. Meth. 5:56. 1804; FBI 4:710; C 2:564; S & J 42.

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Decumbent or climbing, glabrous herbs. Leaves 2-6.5 × 1.5-6 cm, broadly ovate or suborbicular. Flowers pale-pink or white, few, in distant whorls on long pedunculate racemes. Fruit 0.2-0.4 cm long, clavate.

Kutch, Saurashtra and north Gujarat; occasional in hedges. (ZERI SATODO, VASEDO, PUNARNAVA)

FLS & FRS : Aug.-Dec.

BOUGAINVILLEA

Comm. ex A. L. de Juss. corr. Spach. nom. cons.

Key to species

1. Perianth tube densely pubescent; leaves and stem pubescent at least in younger parts .. .. *B. spectabilis*
1. Perianth tube more or less puberulent; leaves and stems subglabrous.. .. ..*B. glabra*

Bougainvillea glabra Choisy in DC. Prodr. 13(2):457. 1849; C 2:567; Bailey 358.

A scandent or straggling shrub. Leaves 1-10.5 × 0.5-8.6 cm, broadly ovate, glabrous. Flowers in axillary and terminal panicles. Bracts 1-3 × 0.8-2.5 cm, magenta or purple-coloured.

Ornamental.

FLS : Throughout the year.

Bougainvillea spectabilis Willd. Sp. Pl. 2:348. 1799; C 2:567; Bailey 358.

Very similar to the previous species. Flowers crimson, clustered at ends of branches, forming panicles.

Ornamental.

FLS : Throughout the year.

MIRABILIS L.

Mirabilis jalapa L. Sp. Pl. 177. 1753; C 2:567; Bailey 358; WI 6:392; S & J 42.

Erect, much branched, perennial undershrub, with tuberous roots. Leaves 4-9 × 3-5 cm, broadly ovate, glabrous. Flowers white, red or yellow. Fruit globose, ribbed, brownish-black.

Ornamental; native of Tropical America. (GULBAS)

FLS & FRS : More or less throughout the year.

PISONIA L.

Pisonia mitis L. Sp. Pl. 1026. 1753. *Pisonia alba* Span. in Linnaea 25:342. 1841; FBI 4:711. *Pisonia morindifolia* R. Br. Wall. Cat. nd. 7130. 1828; C 2:566; S & J 42. *Pisonia grandis* R. Br. Prodr. 422. 1810; WI 8:119.

The inclusion of this taxon is on the report of Santapau & Janardhanan (1967) from Saurashtra. I have seen no specimens of the same. (VELATI, SALET)

AMARANTHACEAE 102

Key to genera

1. Leaves alternate (rarely also opposite or fascicled e. g. *Aerva sanguinolenta*) :
   2. Perianth parts scarious; fruit more than one-seeded..*Celosia*
   2. Perianth parts not scarious; fruit usually one-seeded :
      3. Flowers usually bright-pink to purple, in lax racemes, usually bisexual.. .. .. *Digera*
      3. Flowers white, creamy-white green or greenish-brown, seldom golden-brown or purplish-brown in simple or compound, compact spikes, unisexual, bisexual or polygamous :
         4. Flowers white-woolly; staminodes present; filaments united at the base forming a hypogynous cup..*Aerva*
         4. Flowers not as above; staminodes absent; filaments free .. .. *Amaranthus*
1. Leaves opposite :
   5. Anthers 1-celled :

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6. Flowers in ovoid or cylindric, terminal heads; stigma bifid .. .. *Gomphrena*

6. Flowers in axillary, clustered heads; stigma capitate .. .. *Alternanthera*

5. Anthers 2-celled :

7. Flowers fascicled; perfect flower one, imperfect several, with perianth parts modified into hooked bristles .. .. *Pupalia*

7. Flowers all perfect, in spikes :

8. Flowers strongly deflexed, spinescent, in long, terminal, lax spikes; stamens 5 with interposed staminodes .. .. *Achyranthes*

8. Flowers not deflexed, in compact, axillary spikes; stamens 5 or 2; staminodes absent :

9. Stamens 2 .. .. *Nothosaerva*

9. Stamens 5 .. .. *Psilostachys*

ACHYRANTHES L.

Key to species and varieties

1. Plants aquatic .. .. *A. aquatica*

1. Plants not aquatic :

2. Leaves thick, elliptic-oblong, ovate or obovate, velvety or silky-tomentose beneath .. .. .. *A. aspera* var. *aspera*

2. Leaves membranous, elliptic-lanceolate or ovate-lanceolate, not tomentose beneath .. .. *A. aspera* var. *porphyristachya*

Achyranthes aquatica R. Br. Prodr. 417. 1810; FBI 4:730; Saxton & Sedgwick in Rec. bot. Surv. Ind. 6(8): 294. 1918.

Aquatic herbs. Leaves 3-10.5×0.8-8 cm, elliptic or lanceolate, densely hairy beneath. Flowers shining white.

North Gujarat (Ghadi)

FLS & FRS : Sep.-Nov.

Achyranthes aspera L. var. **aspera**. *Achyranthes aspera* L. Sp. Pl. 204. 1753; FBI 4:730; C 2:530; WI 1:24. Pl. 6(2); S & J 42.

Pubescent herbs, 30-120 cm tall. Leaves 1.5-7.6×0.9-5 cm. Flowers pale- to bright-purple, distant below, compact above, in long spikes. Fruit oblong-cylindric, yellowish-brown, smooth, glabrous.

Throughout, common. (ANGHEDI, ANGHEDO, AGHADO)

FLS & FRS : Throughout the year.

Achyranthes aspera L. var. **porphyristachya** Hk. f. in Hk. f. FBI 4:730. 1885; Ch & O 196; S & J 42; S 224.

Erect or diffuse herbs. Leaves 3.7-15×1.5-8 cm, membranous, appressed-hairy. Flowers bright-reddish-purple, in 6-30 cm long spikes.

Dangs, Pavagadh and Saurashtra, in forest undergrowth; common at Dangs. (SONAR)

FLS & FRS : Aug.-Feb.

AERVA Forsk. nom. cons.

Key to species

1. Sepals 4; leaves filiform, fascicled; flowers bisexual, pale-pink, in short, terminal, cylindric spikes .. .. *A. monsoniae*

1. Sepals 5; leaves not as above; flowers unisexual, polygamo-dioecious or bisexual, not pale-pink, in axillary or axillary and terminal spikes :

2. Spikes axillary and terminal :

3. Plants erect, suberect or twining; leaves alternate and opposite; flowers bisexual .. .. *A. sanguinolenta*

3. Plants often bushy; leaves alternate; flowers unisexual, dioecious .. .. *A. javanica*

2. Spikes axillary .. .. .. *A. lanata*

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Aerva javanica (Burm. f.) Juss. ex J. A. Schultes, Syst. Veg. (ed. 15) 5:565. 1819; FBI 4:727; C 2:577; Townsand in Nasar & Ali, Fl. West Pakistan no. 71:26. 1974. *Celosia lanata* L. Sp. Pl. 205. 1753 (non *A. lanata* Juss.). *Iresine javanica* Burm. f. Fl. Ind. 212. 1768. *Iresine persica* Burm. f. Fl. Ind. 212. 1768. *Aerva tomentosa* Forsl.. Fl. Aegpt.-Arab. 170. 1775; S & J 42. *Aerva persica* (Burm. f) Merrill in Philip. Journ. Sei. 19:348. 1921; S 223.

Erect, woolly-tomentose undershrubs or shrubs, 0.6–1 m tall. Leaves 1.8–8 × 0.5–1.8 cm, ovate-lanceolate or linear-oblong, greenish-white-tomentose. Spikes greenish-white, woolly, often in leafless, terminal panicles. Utricle orbicular-ovoid, thin, with dark-brown, polished seeds.

North Gujarat, Saurashtra and Kutch, common; rare at Broach and Chhotaudepur (Sankheda-Bahadarpur). (BUR, GORAKHGANJO)

FLS & FRS : July-Jan.

Aerva lanata (L.) Juss. in Ann. Muss. Par. 2:131. 1803; FBI 4:728; C 2:578; WI 1:34; Ch & O 197; S & J 42; S 223. *Achyranthes lanata* L. Sp. Pl. 204. 1753.

An erect or suberect, 20–80 cm tall, grey-tomentose herb. Leaves 1.2–6.5 × 0.8–2.7 cm, elliptic or obovate, rarely suborbicular, appressed-hairy. Spikes 0.6–2.5 cm long. Utricle minute, dark-black, ovoid, polished, smooth, glabrous.

Throughout, everywhere in plains; common. (GORAKH GANJO, KAPURI MADHURI, GORAKHDI, SANI BUR)

FLS & FRS : More or less throughout the year.

Aerva monsoniae (L. f.) Mart. in Nov. Act. Acad. Caes. Leop.-Carol. 13:291. 1826; FBI 4:728; C 2:578. *Illecebrum-monsoniae* L. f. Suppl. 161. 1781.

Erect herbs, densely woolly at nodes, up to 30 cm tall. Leaves 1–2 cm long, glabrous, apiculate. Spikes 0.2–1.5 cm long,

densely silky-villous, terminal. Utricle ellipsoid, minute, with pale-brown, polished seeds.

Reported from Kutch by Thaker J. I. (1926, p. 242); not common; also collected from Chhotaudepur by Shri M. H. Patel (BUR, ZINA PAN NO BUR, SANEPNNJOBUR)

FLS & FRS : July-Sep.

Aerva sanguinolenta (L.) Bl. Bijdr. 547. 1825; Ch & O 197; S & J 42; S 223. *Achyranthes sanguinolenta* L. Sp. Pl. (ed. 2) 294. 1762. *Aerva scandens* Wall. ex Moq. in DC. Prodr. 13(2) : 302. 1849; FBI 4:727; C 2:577.

0.6–1.5 m tall herbs. Leaves 2–14.5 × 0.6–5.5 cm, membranous, elliptic, elliptic-lanceolate, appressed-hairy. Spikes 0.5–2 cm long, solitary or 2–3-clustered, axillary and terminal, forming pseudo-racemes. Utricle minute, broadly ovoid, with shining, black seeds.

Throughout in forest undergrowth, seldom in hedges; occasional. (KARADIA, VELLARO, GORAKHGANJO, BUR-VAL, BURJI VAL)

FLS & FRS : Oct.-Jan.

ALTERNANTHERA Forsk.

Key to species

1. Bracts and tepals spinescent .. .. *A. pungens*

1, Bracts and tepals not as above :

2. All perianth parts prominently 3 nerved.. .. *A. ficoidea*

2. All perianth parts 1-nerved :

3. Utricle obreniform; leaves sessile or nearly so; plants glabrous or sparsely hairy in younger parts.... *A. sessilis*

3. Utricle nearly spherical; leaves distinctly petioled; plants pilose, densely in younger parts .. .. *A. paronychioides*

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Alternanthera ficoidea (L.) R. Br. ex R. & S. Syst. 5:555. 1819; Baker in Fl. Males. 4 (2) : 93.1949. *Gomphrena ficoidea* L. Sp. Pl. 235. 1753. *Gomphrena polygonoides* L. Sp. Pl. 225. 1753 (p. p.). *Alternanthera polygonoides* R. Br. Prodr. 416. 1810.

Diffuse or suberect herbs, sparsely pubescent or nearly glabrous. Leaves 3.5–9×1.4–5.5 cm, elliptic-oblong or obovate, glabrous at length. Spikes white or slightly pinkish, axillary and terminal.

Dangs (Waghai, along road); occasional; native of Brazil.
FLS & FRS : Aug.-Jan.

Alternanthera paronychioides St Hil. Voy. Bres (Ser. II.) 2:43. 1833; Valdekamp in Blumea 19:167. 1971.

Prostrate or suberect, slender, pilose herbs. Leaves 0.5–1× 0.4–0.8 cm, broadly elliptic, rhomboid, obovate or nearly suborbicular, glabrous or thinly pilose above, densely beneath. Spikes densely compact, axillary, 0.3–0.4 cm long. Utricle minute. Seed pale-brown, dorsally compressed, glabrous.

Broach, Rajpipla and Chhotaudepur among grasses in moist river beds; rare.
FLS & FRS : Dec.–May.

Alternanthera pungens H. B. & K. Nov. Gen. & Sp. Pl. 2:206. 1818; Ch & O 199 *Alternanthera repens* (L.) Link, Enum. Pl. Hort. Berol. 1:154. 1821 (non Gmel. 1791).

Creeping herbs. Leaves 0.6–3.5×0.4–2.5 cm, broadly ovate, obovate or almost orbicular, alternate, subopposite or subfascicled, pubescent beneath. Spikes 0.5–1.3 cm across, axillary. Seeds orbicular, smooth, reddish-brown.

Throughout (except Kutch & Saurashtra) among grasses in plains; frequent.

Alternanthera sessilis (L.) DC. Cat. Hort. Monsp. 4:77. 1813; FBI 4:731; WI 1:64; Ch & O 200; S & J 42; S 225. *Gomphrena sessilis* L. Sp. Pl. 225. 1753. *Alternanthera triandra* Lam. Encycl. 1:95. 1783; C 2:584.

Diffuse or prostrate herbs. Leaves 1.5–5×0.4–1.2 cm, linear-lanceolate, elliptic-oblong, sessile or nearly so, more or less glabrous. Spikes compact, axillary white or tinged pink. Utricle obcordate, compressed, with thickened margins. Seeds minute, suborbicular, glabrous.

Throughout, in moist ground, gregarious.
FLS & FRS : Throughout the year.

AMARANTHUS L.

Key to species and varieties

1. Ripe utricle indehiscent or bursting irregularly, falling off together with perianth; flowers trimerous and tepals not provided with long apical awn :
   2. Ripe utricle very strongly corrugated; seed containing part entirely included by perianth from which only seedless conical beak emerges.. .. ..*A. viridis*
   2. Ripe utricle smooth or faintly rugulose; top of the seed containing part slightly emerging from the perianth.... .. ..*A. lividus*
1. Ripe utricle circumscissile a little below the middle; perianth and cup shaped base of the utricle persisting till after fall of lid and seed; flowers pentamerous, if trimerous tepals with long, apical awn (e. g. *A. tricolor*) :
   3. Leaf axils spinous.. .. ..*A. spinosus*
   3. Leaf axils not spinous :
      4. Tepals 3; stamens 3; tepals with long, apical, recurved awn :
         5. Plants erect.. .. ..*A. tricolor* var. *tricolor*
         5. Plants with many prostrate branches from near base of stem.. .. .. ..*A tricolor* var. *tristis*
      4. Tepals 2; stamens 2.. .. ..*A. tenuifolius*
      4. Tepals 5; stamens 5 :

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6. Panicles of spikes very long, drooping from base; tepals of female flowers distinctly overlapping for greater part of their length .. .. ..*A. caudatus*

6. Panicles of spikes relatively short, erect or nodding only in their upper half; tepals of female flowers not or hardly overlapping.. .. ..*A. hybridus* subsp. *cruentus* var. *paniculatus*

Amaranthus caudatus L. Sp. Pl. 990. 1753; FBI 4:719; C 2:576; Bailey 355.

70–120 cm tall, erect, suffrutescent herbs or undershrubs. Leaves 2–6.5×0.9–3 cm, ovate-lanceolate, ovate-rhomboid or rhomboid-lanceolate, glabrous. Panicles of spikes terminal, 8–40 cm long. Utricle circumscissile. Seeds dark-brown, shining.

Balsar and Dangs (Subir); rare in Dangs probably an escape near houses.

FLS & FRS : Aug.–Oct.

Amaranthus hybridus L. subsp. **cruentus** (L.) Thell. var. **paniculatus** (L.) Thell. in Asch. & Graebn. Syn. 5(1):247. 1914; S 222. *Amaranthus cruentus* L. Syst. (ed. 10) 2:1269. 1759. *Amaranthus paniculatus* L. Sp. Pl. (ed. 2) 1406. 1763; FBI 4:718; C 2:573; WI 1:67.

45–200 cm tall, stout, annual herbs. Leaves 3–10×1.3–6.5 cm, boadly ovate to ovate-rhomboid or lanceolate, glabrous. Spikes simple or branched, axillary and terminal, axillary ones 2–8 cm long, terminal one 10–40 cm long. Fruit ovoid, circumscissile. Seeds subglobose, dark-brown or black, smooth, glabrous.

Cultivated; also an escape. (RAJGARO, RAJGIRA)

FLS & FRS : Throughout the year.

Amaranthus lividus L. Sp. Pl. 990. 1753; S & J 42. *Amaranthus blitum* auct. non L.; Miq. Fl. Ind. Bat. 1:1033. 1858; FBI 4:721; C 2:575; WI 1:66.

30–60 cm tall herbs. Leaves 3.5–8×1.5–4 cm, ovate, emarginate at apex, glabrous. Flowers greenish, in axillary clusters and terminal, simple or branched, 6–15 cm long spikes.

Cultivated. (TANDALJO)

FLS & FRS : Throughout the year.

Amaranthus spinosus L. Sp. Pl. 991. 1753; FBI 4:718; C 2:573; WI 1:67. Pl. 13(3); Ch & O 195; S & J 42; S 221.

Erect or diffuse herbs, 25–60 cm tall. Leaves 1.8–8.5×1–4 cm, ovate, ovate-rhomboid, ovate-oblong or elliptic, glabrous. Spikes pale-green, axillary ones globose, 0.5–2 cm across, terminal one simple or branched, 6–25 cm long. Utricle ovoid, circumscissile, membranous, rugose. Seeds nearly orbicular, compressed dark-brown, smooth, glabrous.

Throughout, everywhere; common and abundant.

FLS & FRS : Throughout the year.

Amaranthus tenuifolius Willd. Sp. Pl. 4:381. 1805; FBI 4:722; C 2:576.

Erect or suberect, 10–30 cm tall, annual herbs. Leaves 0.7–4.2×0.4–2.3 cm, oblanceolate-oblong to obovate-oblong, glabrous. Flowers minute, forming axillary clusters. Utricles orbicular, compressed, indehiscent, membranous. Seeds lenticular, brown, shining.

Throughout (except Kutch and Saurashtra); not common in areas of occurrence.

FLS & FRS : Aug.–Apr.

Amaranthus tricolor L. var. **tricolor.** *Amaranthus tricolor* L. Sp. Pl. 989. 1753 (sensu ampl.); S & J 43; S 222. *Amaranthus gangeticus* L. Syst. (ed. 10) 1268. 1759; FBI 4:719; C 2:574; WI 1:67. *Amaranthus polygamus* L. Amoen. Acad. 4:294. 1759.

75–120 cm tall, stout, simple or branched herbs. Leaves 1–8×1.3–9 cm, ovate-rhomboid or ovate-elliptic, glabrous. Spikes

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axillary and terminal, axillary ones globose, 1-2 cm across, terminal ones 10-45 cm long, simple or branched. Utricle ovoid, circumscissile, rugose, membranous. Seeds lenticular, smooth, shining, black.

Throughout, a road side weed, everywhere, not common.

FLS & FRS : Sep.-Jan.

Amaranthus tricolor L. var. **tristis** (Prain) Nayar et al. in Rec. Bot. Surv. Ind. 19(1):113. 1964. *Amaranthas gangeticus* L. var. *tristis* (Willd.) Prain, Bengal Pl. 869. 1903; C 2:574. *Amaranthus tristis* Willd. Sp. Pl. 4:385. 1805.

Reported by Patel A. I. (1972) from Rajpipla (Kevadia); extremely rare.

FLS & FRS : Jan.

Amaranthus viridis L. Sp. Pl. (ed. 2) 1405. 1763; FBI 4:720; C 2:575; Ch & O 106; S 222. *Amaranthus gracilis* Desf. Tabl. Ec. Bot. 43. 1804; S & J 42.

Erect or diffuse annuals, 25-60 cm tall, glabrous. Leaves 1.6–8.5×0.9–5 cm, broadly ovate to ovate-rhomboid, glabrous. Spikes at first green, at length deep-reddish-brown, axillary ones 0.5–2 cm long, terminal one simple or branched, 3–11 cm long.

Throughout; common.

FLS & FRS : Throughout the year.

CELOSIA L.

Celosia argentea L. Sp. Pl. 205. 1753; FBI 4:714; C 2:570; WI 2:113. f. 52; Ch & O 165; S & J 43.

Annuals, erect, simple or branched, glabrous, 30–120 cm tall. Leaves 1.7–15.5×1.2–4 cm, broadly ovate to ovate-lanceolate, linear-lanceolate or elliptic-lanceolate, rarely orbicular. Spikes 5–30 cm long, terminal, bright-pinkish-purple or so only in upper half or completely glistening-white. Utricles greenish-brown, muriculate. Seeds spherical, shallowly notched on one side, compressed, dark-black, smooth, glabrous.

Throughout, everywhere, scattered or subgregarious; common. (LAMBDI, LAMPDI).

FLS & FRS : July-Dec.

DIGERA Forsk.

Digera muricata (L.) Mart. Beitr. Amar. 77. 1825; WI 3:59; Ch & O 198; S & J 43. *Achyranthes muricata* L. Sp. Pl. (ed.2) 295. 1762. *Digera arvensis* Forsk. Fl. Aegpt.-Arab. 65. 1775; FBI 4:717; C 2:572.

Annual, erect, slender herbs, 30–60 cm tall. Leaves 2.8–7.5 ×2–4.8 cm, ovate, ovate-lanceolate, ovate-rhomboid or elliptic, at times nearly orbicular, glabrous. Utricles ovoid or subspherical. Seeds pale-brown, muricate.

Throughout, everywhere, common. (KANJRO, LOLAR)

FLS & FRS : Throughout the year.

GOMPHRENA L.

Key to species

1. Undershrubs, usually erect; spikes white, bright-crimson or bright-purple; dorsal crest of bracteoles well-developed, very distinctly dentate-serrate.. .. ..*G. globosa*
1. Herbs, trailing or decumbent; spikes usually greenish-white; dorsal crest of bracteoles very narrow, entire, not reaching the apex.. .. ..*G. celosioides*

Gomphrena celosioides Mart. in Beitr. Amar. 93. 1825, Ch & O 200; S & J 43; S 226.

Pilose herbs. Leaves 1.5–5.8×0.3–1.5 cm, elliptic-oblong or obovate-oblong, pubescent beneath. Spikes 1.5–5 cm long, terminal, erect. Fruit ovoid or elliptic-oblong, smooth, glabrous. Seeds oblong, glabrous, smooth, notched on one side.

Throughout; common everywhere; native of trop. America.

FLS & FRS : Nearly all the year.

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Gomphrena globosa L. Sp. Pl. 224. 1753; FBI 4:732; C 2:584; Bailey 356; WI 4:168. f. 77; Ch & O 200; S 226.

30–40 cm tall undershrubs, thinly appressed-hairy, glabrescent in older parts. Leaves 2.5–7×0.9–2.4 cm, elliptic-oblong or oblong-obovate, pilose. Spikes globose, solitary or 2–3-fascicled, terminal. Seeds nearly spherical, with a notch on one side, smooth, glabrous.

Ornamental; seldom an escape.

FLS & FRS : Throughout the year.

NOTHOSAERVA Wt.

Nothosaerva brachiata (L.) Wt. Icon. 6:1. 1853; FBI 4:726; C 2:580; WI 7:68. f. 23; Ch & O 198; S & J 43. *Illecebrum brachiatum* L. Mant. 1:213. 1767.

Annual, 15–30 cm tall herbs. Leaves 1.1–5.5×0.6–2.5 cm, ovate, elliptic or ovate-lanceolate, glabrous. Spikes linear-cylindric, creamy-white or with a touch of pink, axillary, solitary or clustered. Utricle globose or oblong, smooth. Seeds biconvex, black, smooth, glabrous, shining, polished.

Throughout, in drying moist ground and cultivated fields; not frequent.

FLS & FRS : Sep.–May

PSILOSTACHYS Hochst.

Psilostachys sericea Hk. f. in Hk. f. FBI 4:726. 1885; C 2:579; S & J 43.

Annual herbs. Leaves 1–2×0.7–1 cm, broadly ovate, appressed-silky-hairy. Flowers in axillary, trichotomous cymes. Utricles subglobose, membranous. Seeds subglobose, smooth, shining, brown.

Saurashtra, Perim Island at the mouth of river Narmada, Broach (Madhi) and Hajira; locally abundant.

FLS & FRS : Oct.–Dec.

PUPALIA A. L. Juss nom. cons.

Pupalia lappacea (L.) Juss. in Ann. Mus. Paris 2:132. 1803; FBI 4:724; C 2:583; Backer in Fl. Males. 4(2):83. 1949; Ch & O 199; S & J 43; WI 8:324. f. 120. *Achyranthes lappacea* L. Sp. Pl. 204. 1753. *Achyranthes atropupurea* Lam. Encycl. Meth. 1:346. 1875. *Pupalia atropurpurea* (Lam.) Moq. in DC. Prodr. 13(2):331. 1849; FBI 4:723; C 2:582.

Erect, suberect or straggling herbs or undershrubs, 45–90 cm tall. Leaves 1.5–9×0.9–4.5 cm, broadly ovate, elliptic or ovate-elliptic, glabrous to tomentose. Flowers clustered, greenish-yellow or slightly tinged pinkish. Utricles membranous, ovoid-oblong, glabrous. Seeds ellipsoid, dorsally compressed, smooth, shining.

Throughout, everywhere; common.

FLS & FRS : Nearly all the year.

CHENOPODIACEAE 103

Key to genera

1. Sepals winged.. .. ..*Salsola*
1. Sepals not winged :
   2. Stem jointed, fleshy; leaves 0 :
      3. Flowers in the axils of scaley bracts on cone-like spikes.. .. ..*Arthrocnemum*
      3. Flowers sunk in the cavities in successive joints.. .. ..*Salicornia*
   2. Stem not jointed, leafy :
      4. Leaves terete or subterete.. .. .. ..*Suaeda*
      4. Leaves not as above :
         5. Flowers all similar, bisexual.. .. ..*Chenopodium*
         5. Flowers dimorphic, unisexual.. .. ..*Atriplex*

ARTHROCNEMUM Moq.

Arthrocnemum indicum (Willd.) Moq. Chenop. Enum. 113. 1840; FBI 5:12; C 2:589; WI 1:123; S & J 43. *Salicornia indica* Willd. in Ges. Naturf. Fr. Neue Schr. 2:111. t. 4. f. 2. 1799.

Scanned by CamScanner

Perennial, succulent, glabrous, 15-30 cm tall herbs, reddish-purple at length; branches opposite, ascending, at times diffuse or prostrate, jointed. Flowers minute, pink, bisexual, 2-3-together. Utricle ovoid, compressed, enclosed in swollen perianth.

Saurashtra and Kutch; common along sea coast. (MACHUR, MACHHAR NI BHAJI, BHOLODO).

FLS & FRS : Dec.-Jan.

ARTIPLEX L.

Key to species

1. Shrubby; leaves elliptic-oblong, nearly orbicular or somewhat obovate .. .. *A. stocksii*

1. Herbaceous; lower leaves deltoid, upper ovate-lanceolate .. .. *A. hortensis*

Artiplex hortensis L. Sp. Pl. 1053. 1753; C 2:588; S & J 43.

Stout, erect, glabrous annuals. Leaves 5-8 cm long. Flowers greenish, in slender panicles. Utricle membranous, enclosed in persistent, dry, venose, orbicular-ovate bracteoles.

Listed by Santapau & Janardhanan (1967) from Saurashtra. According to Cooke (1958) it is generally found as a cultigen.

Artiplex stocksii (Wt.) Boiss. Diagn. (Ser. II.) 4:73. 1859; FBI 4:7; C 2:587; S & J 43. *Obione stocksii* Wt. Icon. t. 1789. 1852.

Perennials, much-branched, 45-75 cm tall. Leaves 0.5-1.2 × 0.4-0.8 cm, fleshy, glabrous, white or glaucous beneath. Male flowers in axillary clusters or short spikes. Utricle membranous, enclosed in persistent bracteoles. Seeds suborbicular, compressed, pale-brown, smooth.

Broach (Dehaj), Cambay, north Gujarat (Kharaghoda), Saurashtra and Kutch, on mud flats along sea coast or in saline soil; not very frequent. (KHATI PALAKH, ADBAU PALAKH. ADBAU TANKO)

FLS & FRS : Sep.-Jan.

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CHENOPODIUM L.

Key to species

1. Seeds smooth, shining .. .. *C. album*
1. Seeds rugose, dull .. .. *C. murale*

Chenopodium album L. Sp. Pl. 219. 1753; FBI 5:3; C 2:586; WI 2:127; Ch & O 201; S & J 43; S 226.

Annual, erect, 20–50 cm tall herbs. Leaves 0.5–3.2×0.3–1.4 cm, elliptic–lanceolate, oblong–lanceolate or oblong–rhomboid, entire or sinuate, glabrous. Flowers minute, green, clustered, in 0.9–1.4 cm long, axillary and terminal, compact spikes. Seeds orbicular, glabrous, black.

Throughout, a weed in cultivated fields; common. (CHIL, CHILNI BHAJI).

FLS & FRS : Nov.–Apr.

Chenopodium murale L. Sp. Pl. 219. 1753; FBI 5:4; C 2:586; S & J 43.

Erect herbs, 20–50 cm tall, lower branches often diffuse. Leaves 1.2–5×0.7–2 cm, elliptic–lanceolate or oblong–lanceolate, toothed, glabrous. Flowers as in *C. album*. Seeds orbicular, compressed, glabrous, black.

Throughout, with the previous species; common. (BILARO, BALARO, BALREJI BHAJI).

FLS & FRS : Nov.–Feb.

SALICORNIA L.

Salicornia brachiata Roxb. Fl. Ind. 1:82. 1820; FBI 5:12; C 2:590; S & J 43; WI 9:169.

This species much resembles *Arthrocnemum indicum* Moq. in general appearance but differs in the position of flowers, which are sunk in cavities in successive joints forming cylindric spikes. Further the seeds of the taxon under consideration are hispid with white hairs, whereas those of *Arthrocnemum* are smooth and glabrous.

Scanned by CamScanner

Saurashtra and Bulsar are the localities from where it is reported; Cooke also cites localities Navsari, Porbandar, Dwarka and Bulsar.

FLS & FRS : Nov.–Dec.

SALSOLA L.

Salsola baryosma (R. & S.) Dandy in F. W. Andr. Fl. Pl. Anglo-Egypt. Sud. 1:111. 1950; S & J 43; WI 9:184. *Chenopodium baryosmum* R. & S. Syst. 6:269. 1820. *Salsola foetida* Del. Fl. Egypte 57.1813 (nomen); FBI 5:18; C 2:593.

Much branched, spreading, hoary undershrubs. Leaves minute, fleshy, suborbicular, floral leaves imbricating, forming short, cylindric spikes. Flowers minute. Perianth accrescent in fruit, oblong.

Saurashtra and north Gujarat (Keshni and Kharaghoda); rare on Khari river slopes at Keshni.

FLS & FRS : Jan.

SUAEDA Forsk. ex Scop. nom. cons.

Key to species

1. Annuals, erect; stigmas 2; seeds usually horizontal..*S. maritima*
1. Perennials, erect or diffuse; stigmas 3; seeds usually erect :
   2. Erect; flowers 1–3–nate; bracteoles with entire or slightly toothed margins.. .. ..*S. fruticosa*
   2. Diffuse; flowers many, in dense clusters; bracteoles with pectinate margins.. .. ..*S. nudiflora*

Suaeda fruticosa (L.) Forsk. Fl. Aegpt.–Arab. 70. 1775; FBI 5:13; C 2:590; S & J 43. *Chenopodium fruticosum* L. Sp. Pl. 221. 1753.

Perennials. Leaves 0.5–2 cm long, subterete, fleshy, linear–oblong, obovate, spathulate or elliptic–oblong. Flowers greenish. Utricle minute, obovoid. Seeds obliquely ovoid, compressed, smooth, shining, black when ripe.

Along sea coast on mud flats mixed with other species of the genus; common; Cooke also listed it from Gujarat. (MORAS, KHARI LUNI-NI-BHAJI)

FLS & FRS : Sep.–Dec.

Suaeda maritima (L.) Dum. Fl. Belg. 22. 1827; FBI 5:14; C 2:591; S & J 43. *Chenopodium maritimum* L. Sp. Pl. 221. 1753.

Listed by Santapau & Janardhanan (1967) from Saurashtra and by Thaker J. I. (1926, p. 247) from Kutch. (LUNO, LANO)

Suaeda nudiflora (Willd.) Moq. in Ann. Sci. Nat. 23:316. 1831; FBI 5:14; C 2:591; S & J 43. *Salsola nudiflora* Willd. Sp. Pl. 1:1313. 1797.

Prostrate, much–branched undershrubs, with 10–45 cm long, glabrous branches. Leaves 0.7–2 cm long, linear–oblong or somewhat obovate or spathulate, glabrous, fleshy. Flowers greenish, in axillary, dense clusters, culminating into terminal spikes. Utricle ovoid. Seeds lenticular, smooth, shining.

Along sea coast on mud flats; common. (MORAS)

FLS & FRS : Sep.–Feb.

BASELLACEAE 104

BASELLA L.

Basella rubra L. Sp. Pl. 272. 1753; FBI 5:20; C 2:594; WI 1:159; Bailey 367; Maheshwari, Fl. Delhi 304. 1963. *Basella alba* L. Sp. Pl. 272. 1753; S & J 43.

A perennial, twining, much–branched herb, with bright–pinkish–red to deep–purple stem and branches. Leaves 1.7–15 ×3.2–13 cm, broadly ovate, subfleshy, glabrous. Flowers bright–pink or white, in short spikes. Utricle globose, glabrous, dark–purple or nearly black or white.

Cultivated; often an escape, at some places naturalized. (POI)

FLS & FRS : Throughout the year.

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PHYTOLACCACEAE 105

RIVINIA L.

Rivinia humilis L. Sp. Pl. 121. 1753; Bailey 359. t. 60; Baker in Fl. Males. 4(3):229. f. 1.1951; WI 9:49. *Rivinia laevis* L. Mant. 1:41. 1767; FBI 5:21.

30–45 cm tall, erect, glabrous herbs, somewhat woody at base. Leaves 5–8×2.5-4 cm, ovate–lanceolate, pubescent beneath. Flowers white, in 3–8.3 cm long, terminal and axillary racemes. Berries 0.2–0.3 cm across, deep–red, smooth, glabrous.

Saxton & Sedgwick (1918). reported it as an escape in Sabarmati river bed at Ahmedabad; native of America.

FLS & FRS : Sep.–Oct.

POLYGONACEAE 106

Key to genera

1. Habit erect :
   2. Perianth 4–5 (3)–cleft; stigmas capitellate; fruit compressed or 3–gonous nut .. .. *Polygonum*
   2. Perianth 6–cleft, 3 inner segments much enlarged in fruit; stigmas fimbriate; fruit a small, triquetrous nut .. *Rumex*
1. Habit climbing .. .. *Antigonon*

Antigonon leptopus Hk. & Arn. Bot. Beech. Voy. 308. t. 69. 1841; C 3:10; Bailey 351; S & J 43; S 228.

Perennial climbers, woody at base. Leaves 2–10.4×1.5–6 cm, broadly ovate to ovate–triangular, puberulous or glabrous. Flowers bright–rosy–pink or white, in 5–20 cm long, axillary and terminal, tendrillar racemes.

Cultivated; also an escape; at some places naturalized; native of South America.

FLS : Throughout the year.

Scanned by CamScanner

POLYGONUM L.

Key to species

1. Plants erect :
   2. Leaves triangular–cordate; flowers in subcapitate cymes; nut much exceeding the perianth .. .. *P. fagopyrum*
   2. Leaves not as above ; flowers in long racemes or spikes ; nut not exceeding the perianth :
      3. Stipules strigosely ciliate; nut distinctly trigonous.. .. .. *P. barbatum* var. *gracile*
      3. Stipules eciliate; nut biconvex.. .. .. *P. glabrum*
1. Plants prostrate.. .. .. *P. plebeium*

Polygonum barbatum L. var. **gracile** Steward in Contrib. Gray Herb. 88:50. 1930; WI 8:195. f. 72. *Polygonum serrulatum* auct. non Lagasca, nec Meissn., nec Miq.; FBI 5:38; C 3:7.

Erect, slender, simple or branched herbs. Leaves 6–10.5 × 0.7–1.2 cm, linear–lanceolate, appressed–hairy. Flowers white or tinged pink, in 4–6 cm long, axillary and terminal, simple or branched racemes. Nut smooth, glabrous, dull–black, acute at ends.

Bulsar, Dangs, Dharampur, Broach, Rajpipla, Chhotaudepur, Panchmahals and north Gujarat; occasional along banks of rivers.

FLS & FRS : Nov.–Apr.

Polygonum fagopyrum L. Sp. Pl. 364. 1753; S 227. *Fagopyrum esculentum* Moench. Meth. 290. 1794; FBI 5:55; C 3:10; Bailey 349; WI 4:1. ff. 1–3.

A much branched, glabrous undershrub. Leaves 4–8 × 3–5.5 cm, broadly triangular–ovate, glabrous. Flowers pale–to bright–pink, in subcapicate cymes. Nut distinctly triangular.

Panchmahals, along railway lines at Dohad in central Gujarat; not frequent; certainly an escape.

FLS & FRS : Sep.

THE TERRITORIAL WATERS OF INDIA EXTEND IN TO THE SEA TO A DISTANCE OF TWELVE NAUTICAL MILES, MEASURED FROM THE APPROPRIATE BASE LINE.

BASED UPON SURVEY OF INDIA MAP WITH THE PERMISSION OF THE SURVEYOR GENERAL OF INDIA.

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Polygonum glabrum Willd. Sp. Pl. 2:447. 1799; FBI 5:34; C 3:5; S 227; WI 8:197. f. 74.

Erect, rigid herbs, 30–60 cm tall. Leaves 4–17×0.4–3.2 cm, lanceolate, glabrous. Flowers pale-to bright pink, in 3–15 cm long, slender, simple or branched spikes. Nut black, smooth, glabrous.

Throughout (except Kutch, Saurashtra) along river banks and margins of ditches; not common.

FLS & FRS : Throughout the year.

Polygonum plebeium R. Br. Prodr. 420. 1810; FBI 5:27; C 3:4; Ch & O 201; S & J 43; S 226; WI 8:201.

Prostrate herbs, often radially spreading. Leaves 0.4–1.8 cm long, linear-oblong, obovate or spathulate, glabrous. Flowers pale-to bright-pink, solitary, axillary or 2–3 fascicled. Nut trigonous, black, glabrous, acute at ends.

Throughout in drying moist ground, everywhere; common and abundant.

FLS & FRS : Sep.–May

RUMEX L.

Rumex dentatus L. Mant. 2:226. 1771; FBI 5:59; C 3:10; S 227.

Simple or branched herbs, 25–45 cm tall. Leaves both radical and cauline, cauline ones 4–15×0.4–4.5 cm, radical ones much larger, all linear-lanceolate, oblong or elliptic-oblong, glabrous. Flowers minute, green to greenish-white, in distinct whorls, forming 10–25 cm long, leafy racemes. Nut triquetrous, black, smooth, shining.

In moist ground in river beds at Bulsar, Broach, Rajpipla, Chhotaudepur; occasional.

FLS & FRS : Dec.-Apr.

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ARISTOLOCHIACEAE

ARISTOLOCHIA L.

Key to species

1. Usually prostrate; flower solitary; bracteoles 2, foliaceous at the base of a flower.. .. ..*A. bracteolata*
1. Usually twining; flowers few, panicled; bracteoles absent.... .. ..*A. indica*

Aristolochia bracteolata Lam. Encycl. 1:258. 1783; Ch & O 202; S & J 43. *Aristolochia bracteata* Retz. Obs. 5:29. 1789; FBI 5:75; C 3:16; WI 1:117.

Prostrate, perennial herbs or undershrubs. Leaves 2–7.5 cm long and as much broad, broadly ovate or reniform, glabrous. Flowers dark-purple, axillary, solitary. Capsule 1–1.5 cm long, oblong-ellipsoid, glabrous, ribbed.

Throughout in plains, at times forming loose patches. (KIDAMARI)

FLS & FRS : July–Dec., sometimes almost throughout the year.

Aristolochia indica L. Sp. Pl. 960. 1753; FBI 5:75; C 3:16; WI 1:118. Pl. 17 (1); S & J 44.

Twining, woody herbs. Leaves 5–10×2.5–5 cm, ovate-elliptic or panduriform, glabrous. Flowers few, in short, axillary fascicles. Capsules 2–3 cm long, oblong or globose-oblong, black on drying. Seeds flat, deltoid-ovate, acute, winged.

Saurashtra, Panchmahals and north Gujarat; occasional to common in localities of occurrence.

FLS & FRS : Sep.–Oct.

PIPERACEAE

PEPEROMIA R. & P.

Peperomia pellucida (L.) H. B. & K. Nov. Gen. & Sp. 1:64. 1815; C 3:21; WI 7:390; S 229. *Piper pellucidum* L. Sp. Pl. 30. 1753.

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10–40 cm tall, subfleshy, slender herbs, rooting at lower nodes. Leaves 1–3.3×1.2–3 cm, broadly ovate, membranous, glabrous. Flowers minute, sunk in 2.5–4.7 cm long, terminal or leaf-opposed spikes. Ripe nuts minute, ovoid, black.

Dharampur, on old walls; common.

FLS & FRS : Aug.–Oct.

LAURACEAE

CASSYTHA L.

Cassytha filiformis L. Sp. Pl. 35. 1753; FBI 5:188; C 3:35; WI 2:99; S & J 44.

Leafless, dark-green parasites. Flowers small, creamy-white, in lax, lateral, divaricate cymes. Drupes globose, smooth.

Saurashtra and Bulsar.

FLS & FRS : Nearly the whole year.

PROTEACEAE

GREVILLEA R. Br. corr. R. Br. nom. cons.

Grevillea robusta Cunn. ex R. Br. Suppl. Prodr. 24. 1830; Bor 149; Bailey 345; WI 4:259. f. 125; S 233.

12–18 m tall trees with grey to greyish-brown bark. Leaves 15–30 cm long, deeply pinnatisect; segments 13–23×4.5–9.5 cm, linear, entire or pinnatifid, softly pubescent beneath. Flowers 2.5–3 cm long, orange-red, showy, in 10–15 cm long panicles.

Ornamental in gardens and along roads. (SILVER OAK)

FLS : Mar.–May

LORANTHACEAE

Key to genera

1. Leafy parasites: branches terete; flowers 3.5–4 cm long, red or creamy-yellow .. .. *Dendrophthoe*
1. Leafless parasites; branches flattened; flowers pale-creamy-white, 0.3–0.5 cm across .. .. *Viscum*

DENDROPHTHOE Mart.

Key to varieties of *D. falcata*

1. Peduncle, pedicel, perianth parts pubescent.. .. *D. falcata* var. *pubescens*
1. Peduncle, pedicel, perianth parts glabrous .. *D. falcata* var. *falcata*

Dendrophthoe falcata (L. f.) Etting. var. **falcata**. *Dendrophthoe falcata* (L. f.) Etting. in Denks. Acad. Wissen. Math.-Nat. Cl. 32:52–53 & 58. t. 13. f. 14. 1872; WI 3:34; Ch & O 203; S 234. *Loranthus falcatus* L. f. Suppl. 211. 1781. *Loranthus longiflorus* Desr. in Lam. Encycl. 3:598. 1789; FBI 5:214; C 3:42. *Loranthus longiflorus* Desr. var. *coccinea* Talb. Tr. (ed. 1) 172. 1894; C 3:43. *Dendrophthoe falcata* (L. f.) Etting. var. *coccinea* (Talb.) Santapau, Pl. Saurashtra 34. 1953.

Dichotomously branched shrubs, with twiggy branches. Leaves 4–25×2.8–13 cm, glabrous, coriaceous, elliptic-oblong, obovate or ovate-lanceolate. Flowers white, creamy-white or with a touch of pink or completely red, in 2–6 cm long, unilateral spikes, axillary or on old wood. Berries 0.7–1 cm long, globose or ovoid, bright red.

Throughout, a common parasite on several hosts. (VANDO)

FLS : Sep.–May *FRS* : Oct.–May

Dendropthoe falcata (L. f.) Etting. var. **pubescens** (Hk. f.) Sant. & Herb. ex Shah in Journ. Bombay Univ. 30:37. 1961–1962. *Loranthus longiflorus* Desr. var. *pubescens* Hk. f. in Hk. f. FBI 5:215. 1886; C 3:43.

Dangs (Malegaon, Subir). (BENVEL, VANDO)

FLS & FRS : Nov.–Feb.

VISCUM L.

Viscum articulatum Burm. f. Fl. Ind. 311. 1768; FBI 5:226; C 3:47; *Viscum nepalense* Spr. Syst. Cur. Post. 47. 1827; Ch & O 202; S & J 44; S 238.

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A dichotomously branched, leafless parasite, with joint flattened, dark-green branches. Flowers greenish-yellow, 0.3-.5 cm across.

Dangs, Rajpipla, Chhotaudepur, Pavagadh, Saurashtra and Kutch, on a number of trees; not common. (જોરોવાંદો)

FLS & FRS : Feb.–May

SANTALACEAE

SANTALUM L.

Santalum album L. Sp Pl. 349. 1753; FBI 5:231; C 3:45; Bor 238; Ch & O 204; S & J 44; WI 9:208. ff. 65-69.

5–8 m tall trees, with deeply longitudinally fissured, light-blackish-brown, rough bark. Leaves 2.8–7 × 1.5–3 cm, elliptic-lanceolate, glabrous. Flowers brownish-purple, inodorous, in terminal and axillary cymes. Drupes subglobose or ellipsoid, 0.8–1.2 cm across, glabrous, when ripe deep-purple.

Planted, seldom wild (Rajpipla-Gumandev); rather rare. (CHANDAN)

FLS : Aug.–Dec. *FRS :* Nov.–Dec.

EUPHORBIACEAE

Key to genera

1. Plants twining .. .. *Dalechampia*
1. Plants not twining :
2. Male and female flowers much reduced and enclosed in a common involucre, i. e. inflorescence is cyathium :
3. Involucre slipper-shaped .. .. .. *Pedilanthus*
3. Involucre cup-shaped .. .. *Euphorbia*
2. Male and female flowers not as above :
4. Petals present in both sexes or at least sepals petaloid when petals absent :
5. Trees or shrubs :
6. Flowers in axillary clusters or clusters in racemes on leafless woody branches .. .. .. *Bridelia*
6. Flowers in terminal, 2–3-chotomous cymes .. .. *Jatropha*
5. Herbs :
7. Erect or prostrate, stellate-tomentose; seeds estropl[illegible]late .. .. *Chrozophora*
7. Erect, [illegible]ody herbs, not stellate-tomentose; seeds with a [illegible]hite spongy cap .. .. .. *Croton*
4. Petals absent [illegible] both the sexes :
8. Plants wi[illegible] irritating hairs .. .. .. *Tragia*
8. Plants not [illegible]s above :
9. Cocci weakly spinous or with two rows of spinules on back of each coccus :
10. Shrubs or trees.. .. .. .. *Ricinus*
10. Herbs.. .. .. *Sebastiania*
9. Fruit not echinate or spinules absent :
11. Trees :
12. Leaves resinous-glandular beneath; fruit covered with red, resinous powder.. .. .. *Mallotus*
12. Leaves and fruits not as above :
13. Plants dioecious :
14. Male flowers in clusters, female subsolitary; style much dilated .. .. *Drypetes*
14. Male flowers in racemes, female solitary or racemose; style not dilated :
15. Leaves alternate.. *Antidesma*
15. Leaves opposite..... *Trewia*
13. Plants monoecious :
16. Flowers in axillary fascicles; fruit fleshy, indehiscent :
17. Flowers in axillary fascicles; drupes not angled. *Emblica*
17. Flowers in pendulous spikes; drupes angled.... *Cicca*

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16. Flowers in erect spikes; fruit fleshy but at length dry, dehiscent .. .. *Sapium*

11. Shrubs :

18. Male flowers axillary, solitary or clustered :

19. Pistillode in male flowers large; stamens 5.. .. .. *Securinega*

19. Monoecious; pistillode absent; stamens 3–5 :

20. Stamens 5, in 2 series; 3 inner filaments connate.. .. .. *Kirganelia*

20. Stamens 3; filaments united :

21. Disc absent in both sexes; fruit indehiscent, fleshy.. .. .. .. *Breynia*

21. Disc present in both sexes; fruit dehiscent, dry .. .. .. *Phyllanthus*

18. Male and females in axillary or infra-axillary spikes .. .. *Homonoia*

11. Herbs or undershrubs :

22. Female flowers with accrescent leafy bracts.. *Acalypha*

22. Female flowers not as above :

23. Leaves distichous; male flowers in axillary fascicles.. .. .. *Phyllanthus*

23. Leaves not distichous; flowers in racemes :

24. Stout herbs; male sepals 4–6, imbricate, free; stamens 10–30 (20). .. *Baliospermum*

24. Slender herbs; male sepals 3; stamens 5–10.. .. .. *Micrococca*

ACALYPHA L.

Key to species

1. Bracts concealing the capsule :

2. Bracts fimbriate; capsule glabrous.. .. .. *A. ciliata*

2. Bracts toothed; capsule hispid.. .. .. .. *A. indica*

1. Bracts not concealing the capsule :

3. Bracts glabrous, bordered with gland-tipped hairs; capsule glabrous or nearly so.. .. .. .. *A. malabarica*

3. Bracts hairy, not bordered with gland-tipped hairs; capsule hispid with bulbous based hairs.. .. .. *A. lanceolata*

Acalypha ciliata Forsk.

Acalypha ciliata Forsk. Fl. Aegypt.-Arab. 162. 1775; FBI 5:417; C 3:109; Ch & O 214; S & J 44.

25–50 cm tall, erect herbs. Leaves 2.7–8.5 × 1.7–4.5 cm, ovate, glabrous. Flowers greenish, in axillary, 1.2–3 cm long, androgynous spikes. Capsule 0.2–0.25 cm across, 3-lobed, cocci white, smooth, glabrous. Seeds oblong, smooth, glabrous, reddish-brown.

Throughout, a weed in moist ground; not common. (DADARI, RUNCHALO DADRO, CHARDADARJO)

FLS & FRS : July-Dec.

Acalypha indica L. Sp. Pl. 1003. 1753; FBI 5:416; C 3:108; Ch & O 213; WI 1:20. Pl. 6 (1); S & J 44.

15–45 cm tall herbs. Leaves 1.7–7 × 1–5 cm, ovate or ovate rhomboid, rarely obovate, glabrous. Flowers greenish-yellow, in 3–8.5 cm long, axillary, lax, androgynous spikes. Capsule greyish-white, hispid. Seeds subglobose or ovoid, lead-coloured or pale-brown, glabrous, smooth.

Throughout, common, everywhere. (DADARI, DADARJO, DADARO, VAICHIKATO)

FLS & FRS : June-Dec.

Acalypha lanceolata Willd. Sp. Pl. 4:524. 1805; C [illegible] *Acalypha fallax* Muell.-Arg. in Linnaea 34:43. 1865; FBI [illegible]

[illegible], [illegible]escent, 1–3 cm tall herbs. Leaves 0.9–3.5 × 0.5–2.5 cm, ovate to ovate-lanceolate, glabrous, serrate. Flowers greenish-yellow, in 0.7–6.5 cm long, axillary spikes. Capsule hirsute, slightly exerted from the persistent bract. Seeds globose, lead-coloured or pale-brown, smooth, glabrous.

Rajpipla, Broach and Chhotaudepur; rare.

FLS & FRS : Oct.-Nov.

Acalypha malabarica Muell.-Arg. in Linnaea 34:42. 1865; FBI 5:416; C 3:109; S & J 44.

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Stout, leafy herbs. Leaves 2.5–4×1–1.8 cm, elliptic or elliptic–lanceolate. Flowers minute, in axillary, small, androgynous spikes. Capsule glabrous. Seeds globose–ovoid, pale–brown, smooth, glabrous.

Reported from Saurashtra and Chhotaudepur forest division.

FLS & FRS : July–Aug.

ANTIDESMA L.

Antidesma ghaesaembilla Gaertn. Fruct. 1:189. 1788; FBI 5:357; C 3:89; WI 1:84.

Deciduous trees, with grey bark. Leaves 5–12×3–7 cm, broadly elliptic or orbicular–oblong. Flowers sessile, in slender spikes. Drupes subglobose, 0.4–0.6 cm across, reddish–purple or almost black when ripe.

Collected by Dastur (no. 79) from Dangs; also reported from Bulsar, growing in hedges.

FRS : Oct.

BALIOSPERMUM Bl.

Baliospermum montanum (Willd.) Muell.–Arg. in DC. Prodr. 15(2): 1125. 1866; WI 1:144; Ch & O 215; S & J 44. *Jatropha montana* Willd. Sp. Pl. 4:563. 1805. *Baliospermum axillare* Bl. Bijdr. 604. 1825; FBI 5:461; C 3:106.

30–100 cm tall, stout, erect herbs or undershrubs. Leaves 3–18×1.6–15.5 cm, broadly ovate, ovate–lanceolate, elliptic or elliptic–lanceolate, rarely obovate, entire or rarely shallowly to deeply 3–lobed, glabrous. Flowers greenish–yellow or creamy–yellow, in 3–8 cm long racemes. Capsule 0.8–1.2×0.6–1 cm, 3–lobed, obovoid, pubescent. Seeds oblong, trigonous, smooth, glabrous, creamy–white, mottled light–black.

Throughout, everywhere; common at some places, otherwise occasional.

FLS & FRS : Sep.–Mar.

BREYNIA J. R. & G. Forst. nom. cons.

Key to species

1. Calyx much enlarged in fruit .. .. *B. retusa*
1. Calyx not or scarcely enlarged in fruit .. .. *B. rhamnoides*

Breynia retusa (Dennst.) Alst. Fl. Kandy 22. f. 107. 1938; S & J 44; S 330. *Phyllanthus retusus* Dennst. Schluess. Hort Malab. 24. 1818. *Phyllanthus turbinatus* Roxb. Fl. Ind. 3:666. 1832. *Melanthesa retusa* (Dennst.) Kostel. Allg. Med.–Pham. Flora 5: 1771. 1835. *Melanthesa turbinata* Wt. Icon. 5(2): 26. t. 1897. 1852. *Breynia patens* Rolfe in Journ. Bot. n. s. 11:359. 1882; FBI 5:329; C 3:79; WI 1 : 227.

1–1.5 m tall, monoecious shrubs, with dark–brown, fissured bark. Leaves 1.5–4×1.3–2.5 cm, glabrous. Flowers pale–yellow, axillary, pendulous, males fascicled, female solitary. Drupes 0.8–1 cm across, globose, reddish–to deep–purple when ripe, smooth, glabrous.

Saurashtra and Kutch. (KAMBOI, KALI KAMBOI, KHED KAMBOI)

FLS & FRS : July–Oct.

Breynia rhamnoides (Bl.) Muell.–Arg. in DC. Prodr. 15(2): 440. 1866; FBI 5:330; C 3:79; WI 1:227. *Melanthesa rhamnoides* Bl. Bijdr. 591. 1825; WI 1:227.

A twiggy shrub, with light–yellowish–black bark. Leaves 2.5–4.5×1.5–2.5 cm, distichous, elliptic or elliptic–oblong, glabrous. Flowers greenish–yellow, males in axillary fascicles, female solitary.

Baroda: very rare.

FLS : Oct.

BRIDELIA Willd.

Key to species

1. Trees :
   2. Flowers in clusters in spikes on leafless branches; monoecious .. .. *B. retusa*
   2. Flowers in clusters in leaf axils; dioecious .. *B. squamosa*

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1. Straggling shrubs :

3. Calyx glabrous; style arms short, thick .. *B. hamiltoniana*

3. Calyx hairy; style arms long, slender .. *B. stipularis*

Bridelia hamiltoniana Wall. ex Muell.–Arg. in Linnaea 34:77. 1805–06; FBI 5:271; C 3:69; S 243.

Deciduous, straggling shrubs. Leaves 3.6–13 × 1.5–7.5 cm, elliptic, elliptic–rhomboid, obovate–oblong or nearly diamond shaped, glabrous, entire or shallowly to deeply lobed near apex. Flowers greenish–yellow, in axillary, sessile clusters. Drupes almost spherical, deep–purple or nearly black, smooth, glabrous.

Bulsar and Sanjan forests in hedges; rare; Cooke also cites locality Gujarat on the authority of Kanitkar.

FLS : Aug.–Dec. *FRS :* Nov.–Feb.

Bridelia retusa (L.) Spr. Syst. Veg. 3:48. 1826; FBI 5:268 (p.p.); C 3:68 (p.p.); Bor 173; WI 1:227; Ch & O 209; S & J 44. *Cluytia retusa* L. Sp. Pl. 1042. 1753.

4–12 m tall trees, with blackish–brown, irregularly fissured bark. Leaves 4.5–32 × 2.7–12 cm, elliptic–oblong, sometimes obovate, tomentose beneath. Flowers creamy–white or pinkish, in 10–25 cm long, terminal panicles of erect or drooping spikes. Drupes 0.6–1.2 cm across, subglobose, smooth glabrous.

Throughout in dry deciduous forests; rather not frequent. (ASAN, MONJ).

FLS : July–Sep. *FRS :* Oct.–Dec.

Bridelia squamosa (Lam.) Gehrm. in Engl. Bot. Jahrb. 41. Beibl. 95:30. 1908; Bor 173; Ch & O 209; S & J 44; S 243. *Cluytia squamosa* Lam. Encycl. 5(2):54. 1790.

Deciduous trees, 8–10 m tall, with yellow bark. Leaves 8.5–[illegible].5 × 6–11 cm, ovate–elliptic or elliptic–oblong, pubescent

beneath. Flowers in axillary clusters, 0.8–1 cm across, globose, dark–purple to almost black, glandulous.

Chhotaudepur, Pavagadh and Saurashtra; not frequent. (ASAN)

FLS & FRS : Aug.–Feb.

Bridelia stipularis (L.) Bl. Bijdr. 597. 1825; FBI 5:270; C 3:68; S & J 44. *Cluytia stipularis* L. Mant. 127. 1767.

Stout, climbing shrubs, sometimes spinous. Leaves 2–8 × 1–5 cm, elliptic–oblong or obovate. Flowers minute, greenish–yellow in axillary clusters.

Included on the authority of Satapau & Janardhanan (1967) who reported it from Saurashtra.

CHROZOPHORA A. H. L. Juss. corr. Bth. nom. cons.

Key to species

1. Ovary and capsule with stellate tomentum and silvery scales .. .. ..

A few plants seen along Narmada river bank at Broach; also collected from Broach by Shri Toor on 19-10-1957 and from Ankleshwar by Dr. S. K. Jain.

FLS & FRS : July-Oct.

Chrozophora prostrata Dalz. in Dalz. & Gibs. Bombay Fl. 233. 1861; C 3:105; WI 2:142; Ch & O 212; S & J 44.

Prostrate herbs. Leaves 1-4×0.5-3 cm, broadly ovate, ovate-oblong or elliptic, deeply bullate and stellate-pubescent above, woolly beneath. Flowers in terminal and axillary, short racemes. Capsule 0.2-0.3 cm across densely stellate-woolly. Seeds light-black, muricate.

Common, throughout in drying moist ground. (BETHO OKHARAD)

FLS & FRS : Nov.-Apr.

Chrozophora rottleri (Geis.) Juss. ex Spr. Syst. 3:850. 1826; Prain in Kew Bull. 1918:15. 1918; WI 2:142; Ch & O 212; S & J 44; S 248. *Croton rottleri* Geis. Crot. Monogr. 57. 1807. *Croton plicatum* Roxb. Hort. Beng. 69. 1814 (nomen) & Fl. Ind. 3:681. 1832 (non Vahl 1790). *Chrozophora plicata* Voigt, Hort. Sub. Calc. 156. 1846; C 3:104 (non A. Juss. 1824). *Chrozophora plicata* Hk. f. in Hk. f. FBI 5:409. 1887.

Erect herbs, 15-40 cm tall, densely woolly. Leaves 2-9 × 1.8-7 cm, broadly ovate, stellately scabrid hairy, densely beneath. Flowers creamy-yellow, in 1-7 cm long, axillary and terminal spikes. Capsule 0.3-0.5 cm across, broadly ovoid-globose, greenish-grey.

Throughout, a weed in cultivated fields and drying moist waste lands; common. (KALO OKHARAD)

FLS & FRS : July-Apr.

Crozophora tinctoria A. Juss. Tent. Euphorb. 28. 1824; FBI 5:408; C 3:104; WI 2:142.

An annual, prostrate, densely stellate-tomentose herb. Leaves 3-7 cm long and almost as much broad, ovate to nearly orbicular, petiolate, entire or obtusely lobed, stellately hairy. Flowers in congested racemes, elongating in fruit. Capsule 0.6-1 cm across.

This plant is listed by Cooke from Gujarat, on the authority of Woodrow.

CICCA L.

Cicca acida (L.) Merr. Interp. Herb. Amb. 3:4. 1917; WI 2:153; Bor 175; S & J 44; S 246. *Averrhoa acida* L. Sp. Pl. 428. 1753. *Cicca disticha* L. Mant. 1:124. 1767. *Phyllanthus distichus* Muell.-Arg. in DC. Prodr. 15(2):413. 1866; FBI 5:304; C 3:85.

5-8 m tall, deciduous trees. Leaves 2-5.5 × 1.5-5 cm, pinnately distichous, glabrous, ovate or elliptic. Flowers clustered on pendulous branches on old wood, reddish. Drupes yellow, somewhat lobed, globose, creamy- to pale-yellow when ripe.

Planted at some places in gardens for its edible, acidic fruits. (KHATA-AMBALA, HARFAREVDI, HARPHARORI)

FLS : Mar.-Apr. *FRS* : Mar.-June

CROTON L.

Croton bonplandianum Baill. in Adans. 4:339. 1864. *Croton sparsiflorum* Morong. in Ann. N. Y. Acad. Sci. 7:221. 1893; WI 2:383.

30-90 cm tall herbs. Leaves 3.5-8 × 1.5-2.5 cm, ovate-lanceolate, serrate, biglandular at base, opposite or whorled at ends of branches, stellate hairy beneath. Flowers pale-creamy-yellow or nearly white, in 5-7 cm long, androgynous spikes, males fascicled above, females solitary below. Capsule 3-angled, stellately hairy, oblong or roundish, separating into 3 cocci. Seeds shining, spongy, oblong with a white caruncle.

A road side weed, seen at some places; where it grows, it is gregarious, seldom scattered; native of South America.

FLS & FRS : Almost throughout the year.

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DALECHAMPIA L.

Dalechampia scandens L. var. cordofana (Hochst. ex A. Rich.) Muell.-Arg. in DC. Prodr. 15(2): 1245. 1866; S & J 44. *Dalechampia cordofana* Hochst. ex A. Rich. Tent. Fl. Abyss. 2:224. 1839 -1845.

Extensive twiners. Leaves palmately 3-foliolate, petiolate; leaflets 1-9×0.4-1.6 cm, oblong-lanceolate, serrate hairy. Flowers monoecious, in axillary, long pedunculate heads. Involucral bracts foliaceous, membranous, greenish to pale-yellow. Capsule globose, lobed, separating into 3-4 cocci. Seeds globose or ellipsoid.

From Broach to Kutch, on hedges; not frequent.

FLS & FRS : Aug.-Oct.

DRYPETES Vahl

Drypetes roxburghii (Wall.) Hurus in Journ. Fac. Sci. Univ. Tokyo Sect. 3. Bot. 6:335. 1954; S & J 45. *Putranjiva roxburghii* Wall. Tent. Fl. Nep. 61. 1826; FBI 5:336; C 3:86; Ch & O 212; WI 8:325. f. 121.

Evergreen trees, 5-20 m tall, with pale-brown, smooth bark. Leaves 4-16×1.8-6.6 cm, glabrous, elliptic-oblong, with undulate margins. Flowers greenish-yellow, axillary. Females 1-3 in cymes. Drupes 1-1.5 cm long, ellipsoid, greyish-white or greyish-brown-tomentose.

Wild in some forests at Pavagadh and Chhotaudepur in central Gujarat and Vireshwar in north Gujarat; planted at many places in gardens, at times along roads. (PUTRANJIVI)

FLS & FRS : July-Dec.

EMBLICA Gaertn.

Emblica officinalis Gaertn. Fruct. 2:122. 1791; WI 3:168. Pl. 17. f. 108; Bor 175; Ch & O 211; S & J 45; S 246. *Phyllanthus emblica* L. Sp. Pl. 982. 1753; FBI 5:289; C 3:81.

Deciduous trees, 8-15 m tall, with yellowish-to greyish-brown, smooth bark, exfoliating into scales. Leaves 0.5-2.2×0.2-0.4 cm long, subsessile, narrowly linear-lanceolate or linear-oblong, glabrous. Flowers greenish-to creamy-yellow, minute, numerous, Drupes 1.5-3 cm across, globose, pale-yellowish-green, smooth, fleshy with 6 faint vertical lines. Seeds 6, 3-gonous.

In deciduous forests, occasional; also planted in gardens and along road sides. (AMBLA)

FLS : Mar.-Apr. *FRS :* June-Sep.

EUPHORBIA L.

Key to species

1. Leaves all radical, from underground root stocks .. *E. acaulis*
1. Leaves and stem not as above :
   2. Floral leaves when present deep-red or scarlet in the basal 1/3 on adaxial surface; inflorescence greenish; most of the leaves panduriform .. .. .. *E. heterophylla*
   2. Floral leaves when present completely deep-red or scarlet; inflorescence bright-yellow; leaves not as above .. .. *E. pulcherrima*
   2. Floral leaves when present not as above :
      3. Shrubs :
         4. Plants armed :
            5. Involucral limb bright-rosy-purple .. *E. milli*
            5. Involucral limbs not as above :
               6. Stem distinctly angled at least in younger parts. .. .. *E. neriifolia*
               6. Stem cylindric .. .. .. *E. nivulia*
         4. Plants unarmed .. .. .. *E. tirucalli*
      3. Herbs :
         7. Leaves stipulate, alternate below, opposite above or all alternate, except upper most floral leaves :
            8. Stem at least in the fresh state geniculate or zigzag; leaves broadly elliptic or obovate.. .. ..*E. geniculata*

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8. Stem not as above; leaves linear to linear-lanceolate :
   9. Floral leaves (bracts) very broad and short, ovate or almost orbicular :
      10. Bracts not perfoliate.. .. .. ..*E. rothiana*
      10. Bracts perfoliate.. .. .. ..*E. perbracteata*
   9. Floral leaves not as above.. .. .. *E. dracunculoides*
7. Leaves all opposite, stipulate or if stipules absent, opposite pair of leaves joined by interpetiolar line :
   11. Gland of involucre with a conspicuous petaloid limb :
      12. Floral leaves distinctly imbricating, secund, concealing the involucre :
         13. Capsule glabrous .. .. *E. pycnostegia*
         13. Capsule hairy ... . *E. elegans*
      12. Floral leaves not distichously imbricating, not concealing the involucres :
         14. Involucres in many-flowered cymes; plants suberect, erect, diffuse or prostrate, appressed-hairy atleast in younger parts.. ..*E. parviflora*
         14. Involucre solitary; plants decumbent, glabrous .. ..*E. linearifolia*
   11. Gland of involucre without a petaloid limb or the limb not conspicuous :
      15. Leaves more than 1 cm long; stem and branches patently hairy.. .. ..*E. hirta*
      15. Leaves less than 1 cm long; stem glabrous or appressed-hairy :
         16. Stem hairy; capsule hairy or pubescent on angles or all over :
            17. Leaves crenulate or serrate atleast in upper half; capsule pubescent; seeds furrowed :
               18. Capsule hairy on angles only.. .. ..*E. prostrata*
               18 Capsule hairy all over..*E. thymifolia*
            17. Leaves entire; capsule hirsute; seeds pitted.. ... .*E. granulata*

16. Stem and capsule glabrous :
   19. Leaves nearly as broad as long; seeds smooth.. .. .. *E. orbiculata*
   19. Leaves much longer than broad; seeds obscurely rugose .. .. *E. clarkeana*

Euphorbia acaulis Roxb. Hort. Beng. 36.1814 (nomen) & Fl. Ind. 2:472. 1824; C 3:57. *Euphorbia fusiformis* Buch.-Ham ex Don, Fl. Nep. 62. 1825; FBI 5:257.

Acaulescent, milky herbs. Leaves 8–30 × 3.5–8.5 cm, obovate-lanceolate, fleshy, glabrous, obtuse at apex, decurrent at base.

Dangs, Rajpipla, Chhotaudepur; not common.

FLS & FRS : Not seen.

Euphorbia clarkeana Hk. f. in Hk. f. FBI 5:253. 1887; C 3:65; S & J 45.

Prostrate, radially spreading herbs. Leaves 0.5–1 × 0.1–0.3 cm, opposite, glabrous, linear-oblong. Involucre axillary, solitary. Capsule glabrous, cocci keeled. Seeds pale-brown, acutely 4-angled, transversely rugose.

Saurashtra, north Gujarat, Cambay and Broach; a weed in drying moist ground and cultivated fields; not very common.

FLS & FRS : Sep.–Nov.

Euphorbia dracunculoides Lam. Encycl. 2:428. 1786; FBI 5:262; C 3:59; WI 3:224; Oh & O 207.

Annual, erect, 15–25 cm tall, glaucous-green herbs. Leaves 1.5–5 × 0.1–0.4 cm, linear to linear-lanceolate, glabrous. Involucre broadly campanulate, subsessile, solitary. Capsule 0.2–0.25 cm long, ellipsoid, rounded at base, obliquely depressed at apex, rugose or tuberculate.

Broach to Saurashtra, a weed of cultivation; frequent in areas of occurrence. (UBHI DUDHELI)

FLS & FRS : Oct.–Mar.

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Euphorbia elegans Spr. Syst. 3:794. 1824; FBI 5:246; C 3:61; S & J 45.

Dichotomously branched, slender, hairy herbs. Leaves 2-3×0.8-1.2 cm, opposite, elliptic-oblong, serrulate. Floral leaves subsessile, broadly elliptic or obovate, dorsally hairy. Inflorescence in the axils of floral leaves. Capsule hairy; cocci subglobose. Seeds 4-angled, transversely parallel-grooved.

Santapau & Janardhanan (1967) listed it from Saurashtra.

Euphorbia geniculata Ort. Nov. Pl. Hort. Maurit. Dec. 18. 1797; FBI 5:266; C 3:66; S & J 45. *Euphorbia prunifolia* Jacq. Hort. Schoenbr. 3:15. 1798; FBI 5:266.

Erect herbs, 20-35 cm tall herbs. Leaves 2.3-11×0.6-5.2 cm, broadly elliptic or obovate, glabrous. Inflorescence in terminal, branched cymes. Capsule 0.4-0.6 cm across, 3-lobed. Seeds obovoid, obscurely trigonous, truncate at one end, acute at the other, black, mottled brown, glabrous.

Native of tropical America, now naturalized in many parts of Gujarat as a road side weed.

FLS & FRS : Throughout the year.

Euphorbia granulata Forsk. Aegpt.-Arab. 94. 1775; FBI 5:252; C 3:65.

Prostrate herbs. Leaves opposite, shortly petioled, coriaceous, oblong or obovate. Inflorescence minute, axillary and on short leafy branchlets, subsessile, turbinate. Capsule ± 0.2 cm across, with hirsute cocci. Seeds quadrangular, bluntly pointed, faintly pitted.

Collected by Saxton (no. 2847) from sandy fields at Ahmedabad; not common.

FLS & FRS : Jan.

Euphorbia heterophylla L. Sp. Pl. 453. 1753; C 3:66; Bailey 618; S & J 45.

Annuals, erect, 30-75 cm tall, simple or branched. Leaves 3-7.5×1.5-3 cm, elliptic or panduriform, rarely obovate, glabrous, entire or sinuous toothed, floral leaves similar, often with a scarlet or deep-red patch in basal half. Involucres in terminal cymes. Capsule 0.4-0.6 cm long, with glabrous or sparingly pubescent cocci.

Mostly ornamental; rarely an escape.

FLS & FRS : Throughout the year.

Euphorbia hirta L. Sp. Pl. 454. 1753; WI 3:225. f. 141; Ch & O 207; S & J 45; S 241. *Euphorbia pilulifera* auct. non L.; FBI 5:250; C 3:64.

Annual, slender herbs, 10-30 cm tall, patently hairy. Leaves 1-4.2×0.5-2 cm, elliptic or ovate-oblong or seldom lanceolate, hairy. Involucres small, greenish-yellow, numerous, in dense, axillary, clustered cymes. Capsule hairy, 3-lobed. Seeds reddish-brown, obtusely ovoid-trigonous faintly transversely rugose.

Throughout, everywhere; common.

FLS & FRS : Throughout the year.

Euphorbia linearifolia Roth, Nov. Pl. Sp. 224. 1821; FBI 5:249; C 3:63; S & J 45.

Decumbent herbs. Leaves 0.5-0.7×0.1-0.2 cm, linear-oblong, glabrous. Inflorescence axillary, solitary, from uppermost axils.

This species is listed by Santapau & Janardhanan (1967) from Saurashtra.

Euphorbia milli Ch. des Moulins in Bull. Nat. Hist. Soc. Linn. Bordeaux 1:27-30. Pl. 1. 1826; WI 3:229. f. 147; Maheshwari, Fl. Delhi 311. 1963. *Euphorbia splendens* Boj. ex Hk. f. in Bot. Mag.

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t. 2902. 1829; C 2 : 66. *Euphorbia bojeri* Hk. in Bot. Mag. t. 3537; Bor & Raizada, Some Beautiful Ind. Climb. & Shrubs 70. f. 106. 1954.

30–50 cm tall, armed shrubs. Leaves 2–4.2×0.6–1.3 cm, glabrous, oblong–obovate or spathulate. Inflorescence showy, in dichotomously branched cymes. Fruits not seen.

Ornamental; native of Madagascar.

FLS : Throughout the year.

Euphorbia neriifolia L. Sp. Pl. 451. 1753; FBI 5:255; C 3:59 WI 3:226. f. 142; Ch & O 206; S & J 45; S 240.

Deciduous shrubs, 1.5–2 m tall, with younger branches strongly 5-angled; stipular thorns black, stout, straight or slightly curved. Leaves 5.3–18×3–10.5 cm, crowded at ends of stems and branches, subfleshy, glabrous, obovate–lanceolate or spathulate. Inflorescence few-flowered cymes, in axils of stipular thorns, towards ends of branches. Capsule 0.8–1.2 cm across, obovoid –trigonous, deep-red or pale-brown, smooth, glabrous.

As a hedge in many places. (Thor)

FLS & FRS : Dec.–Apr.

Euphorbia nivulia Buch.–Ham. in Trans. Linn. Soc. 14:286. 1825; FBI 5:255; WI 3:226. f. 143; S & J 45.

1.5–4 m tall shrubs with cylindrical, stem and branches; stipular thorns glabrous, straight, paired, often blackish. Leaves 8.5–20×4–6.2 cm, crowded at ends of branches, obovate–oblong or spathulate, glabrous. Flowers and fruits as in *E. neriifolia* L.

Throughout as a hedge plant. (THOR)

FLS & FRS : Dec.–May

Euphorbia orbiculata H. B. & K. Nov. Gen. et Sp. 2:52. 1817; Rajgopal & Panigrahi in Taxon 17:547. 1969. *Euphorbia microphylla* Heyne ex Roth, Nov. Pl. Sp. 227. 1821 (non. Lam. 1786); FBI 5:252; C 3:65. *Euphorbia bombaiensis* Sant. in Bull. bot. Soc. Beng. 8:17. 1954; Ch & O 208; S & J 45; S 242.

Prostrate, radially spreading annuals. Leaves 0.2–0.6×0.1–0.3 cm, glabrous, often with pinkish margins. Inflorescence solitary or 2–3–fascicled. Capsules minute, yellowish-brown. Seeds obtusely 4-gonous, pale-reddish-brown, smooth, glabrous.

Throughout, a weed in cultivated fields.

FLS & FRS : Nov.–Apr.

Euphorbia parviflora L. Syst. (ed. 10) 2:1049. 1759; Ch & O 207; S & J 45; S 243. *Euphorbia hypericifolia* L. Sp. Pl. 454. 1753; FBI 5:249; WI 3:225 (omne p.p.). *Euphorbia hypericifolia* L. var. *parviflora* (L.) Hk. f. in Hk. f. FBI 5:250. 1887; C 3:63.

Annual, erect, suberect or prostrate, slender herbs. Leaves 1–4×0.5–2 cm, elliptic–oblong, subsessile, thinly appressed–hairy beneath. Inflorescence axillary, many–flowered, corymbose cymes. Seeds 4–angled, reddish–brown, smooth or very faintly transversely rugose.

Throughout, everywhere; common.

FLS & FRS : Throughout the year.

Euphorbia perbracteata Gage in Kew Bull. 1914:238. 1914; Santapau & Shah in Journ. Bombay nat. Hist. Soc. 62:207. 1965.

Erect herbs, 30–50 cm tall. Leaves 3–3.5×0.2–1 cm, glabrous, opposite, connate at base. Inflorescence terminal, cymose, often solitary between forks of branches; involucral gland half moon-shaped; bracts foliaceous, perfoliate. Capsule smooth. Seeds dark-grey or brown.

Dangs.

FLS & FRS : Dec.–March

Euphorbia prostrata Ait. Hort. Kew. 2:139. 1789; FBI 5:266; Ch & O 208; S & J 45.

Prostrate, radially spreading herbs. Leaves 0.3–0.6×0.25–0.3 cm, oblong, sessile or nearly so, at length glabrous. Inflorescence

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axillary, of minute, greenish-yellow flowers in cymes. Capsule minute, pale-brown, obovoid, smooth. Seeds minute, 4-gonous, reddish-brown, transversely grooved.

Throughout (except Kutch); a weed in cultivated fields and drying moist ground.

FLS & FRS : Almost throughout the year.

Euphorbia pulcherrima Willd. ex Klotz. in Otto & Dietr. Allg. Gartenz. 2:27. 1834; FBI 5:239; C 3:66; Bor 172; S & J 45; S 243. *Poinsettia pulcherrima* R. Grah. in Edinb. New Phil. Journ. 20:412. 1836; Bor & Raizada, Some beautiful Climb. & Shrubs 171. Pl. 61. 1954.

A deciduous shrub, 1.5–2 m tall, with brown bark. Leaves 10–15 × 5–7 cm, ovate–lanceolate or elliptic. Inflorescence terminal, cymose.

Ornamental.

FLS : Nov.–Jan.

Euphorbia pycnostegia Boiss. Cent. Euph. 9. 1860; FBI 5:246; C 3:60; S 241.

Slender, erect annuals, 30–60 cm tall. Leaves 1.4–5.5 × 0.7–2.3 cm, oblong, glabrous, minutely serrulate. Floral leaves broadly ovate or orbicular, imbricating. Inflorescence axillary, solitary. Cocci obtusely keeled. Seeds obtusely 4–gonous, tuberculate.

Dangs (Saputara), on hilly slopes; occasional.

FLS & FRS : Oct.–Dec.

Euphorbia rothiana Spr. Syst. 3:796. 1826; FBI 5:263; C 3:59. *Euphorbia glauca* Roxb. Fl. Ind 3:473. 1832.

Annual or perennial, erect, glaucous herbs, 30–75 cm tall, with plenty of milky juice. Leaves alternate, 3–8.5 × 0.6–1.4 cm, glabrous, subsessile. Inflorescence solitary, in upper axils and

terminal. Floral leaves (bracts) 0.8–1.6 × 0.9–1.8 cm, broadly ovate. Capsule subglobose; cocci obtusely angled, glabrous. Seeds 4-angled, smooth.

Bulsar, Baroda (Harni); at Harni it was noted as a weed in cultivated fields; locally abundant.

FLS & FRS : Dec.–Jan.

Euphorbia thymifolia L. Sp. Pl. 454. 1753; FBI 5:252; C 3:64; WI 34:227. f 144; Ch & O 208; S & J 45; S 241.

Prostrate, often radially spreading, hairy herbs. Leaves 0.2–1 × 0.1–0.7 cm, oblong or nearly orbicular. Inflorescence axillary, cymose. Seeds minute, obtusely 4–gonous, reddish-brown, glabrous, transversely grooved.

Throughout, a weed of cultivated fields, in small or large patches; common.

FLS & FRS : Throughout the year.

Euphorbia tirucalli L. Sp. Pl 452. 1753; FBI 5:254; C 3:66; Bailey 618; Bo. 171; WI 3:227. f. 145; Ch & O 206; S & J 45.

Succulents, dichotomously branched, with white, milky latex; bark ash-coloured, wrinkled, rough, excorticating into irregular scales; ultimate branches dark–green, terete, smooth. Leaves minute (in rainy season), caducous, linear–spathulate.

Throughout, as hedges; also naturalized in some places. (KHARSANI)

FLS & FRS : Not seen.

HOMONOIA Lour.

Key to species

1. Leaves linear–oblong or linear–lanceolate; spikes 5-12 cm long .. .. *H riparia*
1. Leaves obovate or oblanceolate; spikes 2.5-3 5 cm long.. .. ..*H. retusa*

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Homonoia retusa (Grah.) Muell.-Arg. in Linnaea 34:200. 1865; FBI 5:456; C 3:119. *Adelia retusa* Grah. Cat. Pl. Bombay 185.1839.

An evergreen, erect, compact shrub, 2–3 m tall, with cinnamon-brown or blackish-brown, smooth bark. Leaves 2.5–8 × 2–3 cm, sessile or nearly so, with whitish or brownish, orbicular scales beneath. Flowers dioecious, axillary. Capsule 0.3–0.5 cm in diameter, globose, hoary.

Scattered in stony river beds at Rajpipla (near Gora); not very frequent.

FLS & FRS : Nov.–Apr.

Homonoia riparia Lour. Fl. Cochinch. 637. 1790; FBI 5:455; C 3:118; WI 5:113. f. 73. *Adelia nereifolia* Roth, Nov. Pl. Sp. 375. 1821.

An evergreen shrub, 1–3 m tall, with reddish-brown, smooth bark. Leaves 5–20 × 0.6–2.3 cm. Flowers axillary, reddish. Capsules 0.3–0.5 cm across, globose, tomentose.

In stony river beds, scattered or subgregarious at Dangs, Bulsar and Rajpipla. (CHANDRI)

FLS & FRS : Jan.–Apr.

JATROPHA L.

Key to species

1. Flowers blood-red; stem, petiole and leaves glandular-hairy .. .. *J. gossypifolia*
1. Flowers greenish-yellow; stem, petiole and leaves eglandular.. .. .. *J. curcas*

Jatropha curcas L. Sp. Pl. 1006. 1753; FBI 5:383; C 3:95; Bor 183; WI 5:293; Ch & O 214; S & J 45.

A soft-wooded, deciduous shrub, 1–3 m tall; bark greenish-yellow, smooth, often with scars of fallen leaves. Leaves 4.5–18 × 4.8–17.5 cm, broadly ovate or nearly orbicular, entire or shallowly

3–5-lobed, glabrous. Flowers in 6–8.5 cm long, terminal or extra-axillary, paniculate cymes. Capsule 1–2.5 cm in diam. globose or broadly ovoid, yellow, smooth.

Throughout, mostly planted as a hedge or an escape; native of Trop. America. (VILAYTI ARANDI, JAMAL GOTA, RATANJOT)

FLS & FRS : Throughout the year.

Jatropha gossypifolia L. Sp. Pl. 1006. 1753; FBI 5:383; C 3:94; WI 5:295. f. 153; S & J 45.

1–1.5 m tall, erect shrubs, with deep-reddish-brown stem and branches. Leaves 5–11 × 6–13 cm, 3–5-lobed, crimson-red, lobes elliptic-obovate. Flowers deep-red, in terminal, 3–5 cm long, trichotomous cymes. Capsule 1–1.5 cm long, 3-lobed, smooth, glabrous. Seeds 0.6–0.7 cm long, oblong, glabrous, greyish-brown, with pale-yellow or brown strophiole.

Naturalized in many parts, as a road side weed; native of Brazil.

FLS & FRS : Throughout the year.

KIRGANELIA Baill.

Kirganelia reticulata (Poir.) Baill. Etud. Gen. Euph. 613. 1838; WI 5:320; Ch & O 211; S & J 45; S 246. *Phyllanthus reticulatus* Poir. in Lam. Encycl. 5:298. 1804; FBI 5:288; C 3:81.

Straggling, monoecious shrubs, with sarmentose branches and smooth, brownish or brownish-purple bark. Leaves 0.9–3 × 0.6–1.5 cm, elliptic or oblong, glabrous, sessile. Flowers greenish-yellow or creamy-white, axillary, males 2–6-clustered, females solitary. Berries 0.4–0.6 cm across, globose, smooth, glabrous, deep-purple to almost black. Seeds irregularly trigonous, glabrous, finely granulate.

Throughout, as hedges in moist ground; common. (KAMBOI, PICHARUN, DATWAN)

FLS & FRS : Aug.–Jan.

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MALLOTUS Lour.

Mallotus philippensis (Lam.) Muell.-Arg. in Linnaea 34:196. 1865; FBI 5:442; C 3:113; Ch & O 213; S & J 45; S 249. *Croton philippense* Lam. Encycl. 2:206. 1786.

5–10.5 m tall, dioecious trees, with grey bark; young shoots rusty-tomentose. Leaves 4–29 × 2.5–13.5 cm, subcoriaceous, pubescent. Spikes 4–15 cm long, axillary, brownish. Capsules 3-valved, 0.8–1 cm across.

In deciduous forests of south and central Gujarat and Saurashtra; common at Dangs; otherwise not frequent. (SHENDRI, KUKHRO, KAPILO).

FLS : Oct.-Jan. *FRS* : Dec.-Feb.

MICROCOCCA Bth.

Micrococca mercuralis (L.) Bth. in Hk. Niger Fl. 503. 1849; S & J 45. *Tragia mercuralis* L. Sp. Pl. 980. 1753. *Claoxylon mercuralis* Thw. Enum. 271. 1861; FBI 5:412; C 3:107.

Annual, herbs, erect, glabrous or nearly so, 15–40 cm tall. Leaves broadly ovate to ovate-lanceolate, glabrous Flowers few, in distant, slender racemes Capsule subglobose, of 3 hairy cocci. Seeds globose, pale-brown, deeply foveolate.

Saurashtra and Kutch; rare.

FLS & FRS : July-Aug.

PEDILANTHUS Poit. nom. cons.

Pedilanthus tithymaloides (L.) Poir in Ann Mus. Hist. Nat. Paris 19:390. t. 19. 1812; FBI 5:239; C 3.124; WI 7:285; S & J 45; S 252. *Euphorbia tithymaloides* L. Sp. Pl. 453. 1753.

Succulent, deciduous, distinctly geniculate undershrubs. Leaves 3.5–10 × 2.5–8 cm, broadly ovate, glabrous. Inflorescence scarlet or bright-rosy-pink, solitary or few, in cymes at ends of branches.

Ornamental, as a border plant; native of South America. (VILAYTI KHARSANI)

FLS : Jan.-May

PHYLLANTHUS L.

Key to species

1. Slender shrubs .. .. *P. lawii*

1. Herbs or undershrubs :
   2. Stipules peltate :
      3. Leaves closely set; capsule echinate, stem and branches red .. .. *P. urinaria*
      3. Leaves distant, scattered; capsule not echinate; stem and branches not red :
         4. Leaves cuneate obovate .. .. *P. maderaspatensis*
         4. Leaves linear-oblong .. .. .. *P. virgatus*
   2. Stipules epeltate :
      5. Leaves generally acute at apex, not imbricating; seeds with irregular ribs; styles prominent, reflexed with recurved arms .. .. *P. debilis*
      5. Leaves closely distichous, obtuse, rounded or subacute at apex; seeds with regular parallel ribs; styles minute, 2-lobed .. .. *P. fraternus*

Phyllanthus debilis Klein ex Willd. Sp. Pl. 4:582. 1804; FBI 5:299; C 3:84.

15–40 cm tall herbs. Leaves 0.5–1.6 × 0.3–0.9 cm, elliptic, rarely obovate, glabrous. Flowers greenish to creamy-white, axillary, pedicellate. Capsule 0.3–0.35 cm across, depressed-globose, smooth. Seeds minute, trigonous.

Dangs, Rajpipla, Chhotaudepur and Panchmahals not common,

FLS & FRS : Aug.-Sep.

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Phyllanthus fraternus Webster in Contrib. Gray Herb. 176:53. 1955 & Journ. Arn. Arb. 38:309. 1957; WI 8:34. f. 16. *Phyllanthus niruri* auct. non. L. 1753; FBI 5:298; C 3:84; Ch & O 210. *Phyllanthus asperulatus* Sensu S & J 45; S 245.

Annuals, 20–50 cm tall. Leaves 0.4–1 × 0.1–0.4 cm, glabrous, elliptic-oblong or obovate. Flowers pale-greenish-yellow, axillary, minute. Capsule 0.3–0.5 cm across, globose, smooth. Seeds trigonous.

Throughout; common; according to Webster (1955) it is a native of Western India. (BHONYA AMLI)

FLS & FRS : Throughout the year.

Phyllanthus lawii Grah. Cat. Bombay Pl. 181. 1839 ex Hk. f. in Hk. f. FBI 5:290. 1887; C 3:82.

A bush, 1–1.5 m tall, often with dark-purple stem and branches. Leaves 0.4–0.5 × 0.1–0.15 cm, linear-oblong, glabrous, sessile. Flowers axillary. Capsule 0.3–0.5 cm in diam., depressed-globose, smooth, glabrous. Seeds 6, brown, trigonous, round and smooth on dorsal surface.

In Narmada river beds along water courses at Broach, Rajpipla and Chhotaudepur.

FLS & FRS : Nov.–Dec.

Phyllanthus maderaspatensis L. Sp. Pl. 982. 1753; FBI 5:292; C 3:82; Ch & O 210; S & J 45; S 246; WI 8:35.

Annual, erect herbs, 30–45 cm (rarely 1 m) tall, woody at base. Leaves 0.6–2.5 × 0.3–0.9 cm, glabrous. Flowers creamy-white, axillary. Capsules 0.2–0.3 cm across, depressed-globose, smooth.

Throughout, a weed in cultivated fields. (BAKARATO, KANOCHHA)

FLS & FRS : Almost throughout the year.

Phyllanthus urinaria L. Sp. Pl. 982. 1753; FBI 5:293; C 3:83; S & J 45; WI 8:36.

20–40 cm tall herbs. Leaves 0.7–1.6 × 0.3–1 cm, elliptic-oblong or obovate. Capsules pale-brown or yellowish-brown, echinate. Seeds 3-gonous, prominently transversely furrowed, pale-brown.

Throughout Gujarat (except Kutch), in forest undergrowth. (KHARSAD BHONYAMLI, LAL BHUI AMLI)

FLS & FRS : Aug.–Oct.

Phyllanthus virgatus Forst. f. Prodr. 65. 1776; Rau in Bull. bot. Surv. Ind. 10(suppl. 2):72. 1969. *Phyllanthus simplex* Retz. Obs. 5:29. 1789; FBI 5:295; C 3:83; Ch & O 210; WI 8:36; S 251.

Erect, glabrous, 10–50 cm tall, simple or branched herbs, woody at base. Leaves 0.5–3 × 0.2–0.5 cm, glabrous. Flowers creamy-white, axillary. Capsule globose, minutely tuberculate. Seeds 3-gonous, glabrous, dark-brown, finely tubercled.

Throughout; common. (MOTI BHONYAMLI)

FLS & FRS : Aug.–Apr.

RICINUS L

Ricinus communis L. Sp. Pl. 1007. 1753; FBI 5:457; C 3:125; Bor 183; Ch & O 214; S & J 46; S 251; WI 9:26. ff. 15–18.

1.5–5 m tall, with light-or glaucous-grey or reddish, smooth bark. Leaves 10–30 cm or more across, palmately 5–9-lobed, peltate, glabrous. Flowers pale-yellow, in 6-20 cm long, terminal racemes. Fruits 5-furrowed, 1.5-2.5 cm long, indehiscent. Seeds 0.8–1.5 cm long, oblong, greyish-brown, mottled white or creamy, with white caruncle.

Throughout, cultivated or an escape.

FLS & FRS : Throughout the year.

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SAPIUM R. Br.

Sapium insigne Bth. var. **malabaricum** (Wt.) Hk. f. in Hk. f. FBI 5:472. 1885; WI 7:229; S 251. *Falconeria malabarica* Wt. Icon. t. 1886. 1852. *Sapium insigne* Sensu Cooke. Fl Pres. Bomby 2:622. 1906 & 3:121. 1958 (reprinted).

A deciduous tree, 7.5–10.5 m tall, with plenty of latex and ash-coloured, longitudinally fissurred bark. Leaves crowded at ends of branches, 12–25×5–9 cm, elliptic-lanceolate or oblong-lanceolate, glabrous. Flowers appearing after leaf fall, in 15–25 cm long, erect spikes. Capsule 0.6–0.8 cm across, globose or ovoid, fleshy. Seeds 0.5–0.6 cm long, ovoid, smooth, somewhat compressed.

Only one tree in the reserve forest at Malegaon in Dangs. (SHEROD)

FLS & FRS : Feb.–Mar.

SEBESTIANIA Spr.

Sebestiania chamaelea (L.) Muell.-Arg. in DC. Prodr. 15(2): 1175. 1866; FBI 5:475; C 3:124; WI 9:263. f. 83. *Tragia chamaelea* L. Sp. Pl. 981. 1753.

Annuals, erect, 15–30 cm tall. Leaves 1.5–5×0.4–0.7 cm, linear to narrowly linear-oblong, glabrous. Capsule 0.4–0.6 cm long, brown, oblong or subglobose and depressed above, pale- to dark-brown, of 3-cocci. Seeds ellipsoid-oblong, smooth, glabrous, rounded at both ends.

Rajpipla (Thevadia near Gora), in the forest undergrowth; very rare.

FRS : Oct.

SECURINEGA Comm. A. L. Juss. nom. cons.

Key to species

1. Plants unarmed; leaves 2.5–8 cm long .. .. ..*S. virosa*
1. Plants armed; leaves 1–4.3 cm long .. .. *S. leucopyrus*

Securinega leucopyrus (Willd) Muell.-Arg in DC. Prodr. 15(2): 451. 1866; S 244; WI 9:267. *Flueggea leucopyra* Willd. Sp. Pl. 4: 757. 1805; FBI 5:328; C 3:77; S & J 46.

An erect, slender shrub, 1.5–2 m tall; bark smooth, ash-coloured in younger parts, blackish-brown in older. Leaves 0.8–2.7 cm broad, elliptic-obovate or obovate-oblong. Flowers greenish-yellow, in axillary fascicles. Ripe berries 0.6–0.8 cm across, white, smooth, spherical. Seeds pale-brown or yellowish-brown, trigonous, smooth.

Kutch, Saurashtra and Rajpipla; in the former locality reported to be common. (CHHINI, THUMARI, SHENVI)

FLS & FRS : June-Sep.

Securinega virosa (Roxb. ex Willd.) Pax & Hoffm. in Engl. & Prantl Pfam. (ed. 2) 19C: 60. 1931; S & J 46; S 241; WI 9;268. f. 85. *Phyllanthus virosus* Roxb. ex Willd. Sp. Pl. 4:578. 1805. *Flueggea microcarpa* Bl. Bijdr. 580. 1825; FBI 5:328; C 3:77.

Bushy, straggling shrubs, 1.5–3.5 m tall, with light-brown bark. Leaves 2.5–8×1.3–5.8 cm, obovate, elliptic-oblong or nearly orbicular, glabrous. Flowers minute, greenish- or creamy-yellow, in axillary fascicles. Capsule 0.4–0.5 cm across, spherical, white, fleshy or dry.

Throughout (except Kutch) in forest undergrowth or in hedges; not common. (PICHRUN, SAFEDFALI)

FLS : June–Dec. *FRS :* Aug.–Jan.

TRAGIA Plum ex L.

Tragia hildebrandtii Muell.-Arg. in Bremen Abh. 7:26. 1880. *Tragia cannabina* L. f. Suppl. 415. 1781 (nom. illegit.); C 3:120; S & J 46. *Tragia involucrata* L. var. *cannabina* Muell.-Arg. in DC. Prodr. 25(2):944. 1866; FBI 5:465.

30–60 cm tall, erect or straggling, hispid shrubs, with pale-grey or brown bark. Leaves entire or palmately 3 partite,

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2–7.5×0.6–3.5 cm, broadly ovate, hispidly hairy. Racemes 2.5–8.5 cm long, terminal and axillary. Fruits 3-lobed, densely hairy. Seeds smooth, globose, brown, glabrous.

A road side weed at Bulsar, Surat, Broach, Rajpipla and Saurashtra; on the whole rare.

FLS & FRS : July-Apr.

TREWIA L.

Trewia polycarpa Bth. & Hk. f. ex Hk. f. in Hk. f. FBI 5:424. 1887; C 3:112; S 249. *Trewia nudiflora* L. Sp. Pl. 1193. 1753; Pax & Hoffm. in Pfreich. 63:141. 1935 (omne p. p.) *Trewia nudiflora* Wt. Icon. t. 1871 (quoad flor. fem. tentum)

Deciduous trees, 5–8 m tall with grey or greenish-white, smooth bark. Leaves 4.5–28×3.5–25 cm, broadly ovate, densely woolly-tomentose when young, glabrous at length. Male racemes 5.8–12 cm long, pendulous, at ends of branches; female flowers solitary or 2–3-fascicled, axillary or from the axils of fallen leaves. Fruit 0.6–1 cm across, broadly ellipsoid or almost globose, tomentose when young.

Dangs and Rajpipla; rare. (PETAR)

FLS & FRS : Mar.–Apr.

ULMACEAE

Key to genera

1. Leaves elliptic, dark-green on both sides; flowers clustered on leafless branches; fruit samara.. ... ..*Holoptelea*
1. Leaves ovate-lanceolate or oblong-lanceolate, silky-tomentose beneath; flowers on leafy branches; fruit a drupe.. ..*Trema*

HOLOPTELEA Planch.

Holoptelea integrifolia (Roxb.) Planch. in Ann. Sci. Nat. (Ser. 3) 10:266. 1948; FBI 5:481; C 3:127; Bor 130; WI 5:109. f. 68; S & J 46; S 252. *Ulmus integrifolia* Roxb. Pl. Cor. 1:56. t. 78. 1795.

Deciduous trees, 5–16 m tall, with greyish-white or ash-coloured, smooth bark, exfoliating into small scales. Leaves 5.5–12.5×3.7–6.6 cm, coriaceous. Flowers minute, greenish-yellow. Fruit 1.5–2.5×0.8–2.2 cm, winged, flat, broadly oblong or orbicular, deeply notched at apex. Seeds 0.5–0.8 cm long, ovate or ovate-oblong.

Throughout, frequent. (KANJO, PAPADA, AUDO-AODO)

FLS : Dec.–Feb. *FRS :* Jan.–May

TREMA Lour.

Key to species

1. Flowers fascicled, in axillary cymes; cymes longer than the petiole; leaves membranous, softly hairy at least beneath.. .. .. .

A small tree, 5-8 m tall, with brownish bark, younger parts rufous-pubescent. Leaves 3.5-6.5 × 1.5-2.5 cm. Flowers minute, greenish-yellow.

Pavagadh and Chhotaudepur; rare.

FLS : Nov.-Dec.

URTICACEAE

Key to genera

1. Leaves subopposite .. .. *Pilea*
1. Leaves alternate :
   2. Plants with stinging hairs :
      3. Robust, 90–150 cm tall perennials; flowers in peduncled, axillary racemose cymes.. .. .. .. *Girardinia*
      3. Erect or diffuse, 30–60 cm tall annuals; flowers in clustered cymes on 5-45 cm long floral axis.... *Laportea*
   2. Plants without stinging hairs :
      4. Shrubs or undershrubs. .. .. *Boehmeria*
      4. Herbs :
         5. Stigma not articulate; female perianth 3–5–partite or obsolete .. .. *Elatostema*
         5. Stigma articulate; female perianth tubular, shortly toothed or subentire, persistent :
            6. Flowers in axillary clusters; stigma filiform.. .. .. *Pouzolzia*
            6. Flower clusters spicate; stigma linear.... *Distemon*

BOEHMERIA Jacq.

Boehmeria scabrella (Roxb.) Gaud. in Bot. Freyc. Voy. 500. 1826; C 3:135; S 254. *Urtica scabrella* Roxb. Hort. Beng. 67. 1814 (nomen) & Fl. Ind. 3:581. 1832. *Boehmeria platyphylla* Don var. *scabrella* (Roxb.) Wedd. Mon. 365. 1856; FBI 4:578.

Erect, 90–150 cm tall, strigosely hairy shrubs or undershrubs. Leaves 5.7-24 × 3.5-17 cm, broadly ovate, appressed-pubescent, strigosely hairy beneath. Flowers minute, in pisiform clusters, forming 8–20 cm long, interrupted, erect or drooping spikes. Achenes minute, ovoid or ellipsoid, compressed.

Dangs (Saputara), gregarious along Ghat road; common and abundant.

FLS & FRS : Aug.-Oct.

DISTEMON Wedd.

Distemon indicum Wedd. Monogr. Urt. 551. t. 20A. 1911; FBI 5:588.

An erect or suberect, slender, 15–35 cm tall herbs. Leaves 1.6-6.7 × 0.9-4 cm, ovate, cobwebby-pubescent beneath. Flowers minute, in 1.5–6.5 cm long, axillary and terminal, interrupted spikes. Achenes minute, ovoid, ribbed, thinly hairy.

Bansada and Dangs (Ahwa), in dense forest undergrowth; rare.

FLS & FRS : Oct.–Nov.

ELATOSTEMA J. R. & G. Forst. nom. cons.

Elatostema cuneatum Wt. Icon. 6:35. & t. 2091. f. 3. 1853; IBF 5:568; C 3:134; S 254.

6–10 cm tall, simple, pubescent herbs. Leaves 1–3 × 0.6–1.3 cm, falcately cuneate, coarsely crenate above middle. Flowers in sessile heads at each node.

Dharampur (on old walls) and Dangs (in rocky ground).

FLS : Aug.

GIRARDINIA Gaud.

Girardinia zeylanica Decne. in Jacq. Voy. 152. 1844; C 3:132; WI 4:129; Ch & O 216; S & J 46; S 254. *Urtica heterophylla* Roxb. Fl. Ind. 3:586. 1832 (non Vahl). *Girardinia heterophylla* (Roxb.) Decne. var. *zeylanica* Decne. loc. cit.; FBI 5:550.

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Undershrubs. Leaves 6-18 cm in diam., broadly ovate or suborbicular, entire or 3-5-lobed, irritantly hairy. Fruiting cymes 2.5-6 cm long, densely clothed with irritant hairs. Achenes 0.25-0.3 cm long, obliquely ovate, much compressed.

Dharampur, Dangs (Ahwa, Malegaon-Saputara) Pavagadh and Saurashtra; rather common in the hilly parts. (AAGYYA)

FLS & FRS : Oct.-Mar.

LAPORTEA Gaud. nom. cons.

Laportea interrupta (L.) Chew in Gard. Bull. Singapore 19:200. 1965; Raizada in Ind. For. 94(6): 445. 1968. *Utrica interrupta* L. Sp. Pl. 985. 1753. *Fleurya interrupta* (L.) Gaud. in Freyc. Voy. Bot. 497. 1826; FBI 5:548; C 3:131; WI 4:48; Ch & O 216; S 253.

Densely hairy annuals. Leaves 2-13.5 × 1-9.5 cm, broadly ovate or ovate-rhomboid, hispidly hairy. Flowers greenish-white or creamy-yellow. Achenes pale-straw, obovoid, compressed, glabrous.

Umbergaon, Bulsar, Dangs, Chhotaudepur and Pavagadh; occasional in forest undergrowth.

FLS & FRS : Aug.-Nov.

PILEA Lindl. nom. cons.

Pilea microphylla (L.) Liebm. in Vidensk. Solsk. Skr. (Ser. v.) 2:236. 1851; C 3:160; WI 8:58; S 255. *Parietaria microphylla* L. Syst. (ed. 10) 1308. 1759. *Pilea muscosa* Lindl. Coll. Bot. t. 4. 1821; FBI 5:551.

Trailing, slender, subfleshy herbs. Leaves 0.3-0.5 cm long, oblong-spathulate, glabrous. Flowers minute, in axillary fascicles.

Cultivated; also naturalized on old walls at Dharampur; native of South America.

FLS & FRS : Sep.-Dec.

POUZOLZIA Gaud.

Pouzolzia zeylanica (L.) Benn. Pl. Jav. Rar. 67. 1838; Ch & O 217; S & J 46; S 255; WI 8:225. *Parietaria zeylanica* L. Sp. Pl. 1052. 1753. *Parietaria indica* L. Mant. 1:128. 1767. *Pouzolzia indica* (L.) Gaud. Freyc. Voy. Bot. 503. 1826; FBI 5:591; C 3:137.

Annual, 15-60 cm tall, slender herbs. Leaves 1.5-6×0.9-2.8 cm, ovate to ovate-lanceolate, thinly hairy. Flowers minute, whitish or greenish-white. Achenes ovoid, acute, smooth, shining.

Sanjan (Vadali), Dharampur, Bulsar, Dangs, Pavagadh and Saurashtra; frequent to rare in the forest undergrowth.

FLS & FRS : July-Nov.

MORACEAE 116

Key to genera

1. Flowers crowded on the outside of oblong or irregularly globose, large receptacles.. ... .*Artocarpus*
1. Flowers crowded on the inside of fleshy receptacles of which mouth is closed by bracts.. .. ..*Ficus*
1. Flowers usually not crowded inside or on receptacle :
   2. Female flowers solitary, male flowers few, in capitate or subcapitate clusters .. .. *Streblus*
   2. Male and female flowers spicate or female in ovoid heads .. .. *Morus*

ARTOCARPUS J. R. & G. Forst. nom. cons.

Artocarpus heterophyllus Lam. Encycl. 3:209. 1789; S & J 46. *Artocarpus integer* multi auct. non Merrill, Interp. Herb. Amb. 190. 1917; WI 1:125; Bor 136. *Artocarpus integrifolia* multi auct. non L. f. 1781; FBI 5:541; C 3:158.

Evergreen, 7.5-12 m tall trees, with light-black mottled green or dark-brown, rough bark. Leaves 5-17 × 2.3-9.5 cm,

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elliptic-oblong or obovate, glabrous. Inflorescence variable in size, cylindric-oblong, dark-green, mamillate, always on trunks.

Cultivated. (FANAS)

FLS & FRS : Throughout the year.

FICUS L.

Key to species

1. Leaf apices caudate-acuminate or long acuminate :
   2. Bases of leaves slightly narrowed to petiole; apical tail 1/5 as long as main part of blade.. .. ..*F. rumphii*
   2. Bases of leaves cordate; apical tail 1/3 or ½ as long as main part of the blade :
      3. Apical tail upto ½ as long as main part of blade.. .. .. *F. religiosa*
      3. Apical tail not more than 1/3 as long as main part of the blade.. .. ..*F. arnottiana*
1. Leaf apices not as above :
   4. Receptacles sessile or very shortly pedunculate :
      5. Leaves tomentose beneath, atleast when young :
         6. Leaves obtuse; receptacles globose.. ..*F. benghalensis*
         6. Leaves abruptly shortly acuminate; receptacles oblong or obovate.. ..*F. drupacea* var. *pubescens*
      5. Leaves glabrous :
         7. Lateral and secondary nerves close, fine and parallel .. ..*F. microcarpa*
         7. Lateral and secondary nerves not close and parallel .. ..*F. amplissima*
   4. Receptacles pedunculate :
      8. Receptacles in clusters on old trunks or on special branches.. .. ..*F. racemosa*
      8. Receptacles clustered, all axillary or on branches and stems near base .. ..*F. hispida*
      8. Receptacles solitary, or if paired, plants rambling : .. .. *F. carica*
         9. Plants cultivated .. ..
         9. Plants wild :

10. Receptacles solitary :
    11. A rambling shrub; bracts minute, basal or high up on peduncle.. .. ..*F. heterophylla*
    11. Erect shrubs; bracts 0.. .. ..*F. asperrima*
10. Receptacles paired :
    12. Lateral nerves prominent beneath.. ..*F. nervosa*
    12. Lateral nerves not prominent beneath.. ..*F. virens*

Ficus amplissima Sm. in Rees, Cyclop. 14(1): no. 1. 1809; S & J 46. *Ficus tsiela* Roxb. Fl. Ind. 3:549. 1832; FBI 5:515; C 3:150.

Trees, 5–14.5 m tall, with light-grey, smooth bark. Leaves 5–18 × 3.5–11 cm, ovate-oblong or elliptic-oblong, subcoriaceous. Receptacles 1–1.5 cm across, spherical, glabrous, purple when ripe, crowded at ends of branches.

Dangs, Pavagadh, Chhotaudepur, Panchmahals, north Gujarat, Saurashtra and Kutch. (PAYAR)

RECEPTACLES : For the best part of the year.

Ficus arnottiana Miq. in Ann. Mus. Lugd. Bot. 3:287. 1867; FBI 5:513; Ch & O 219; S & J 46; S 259. *Ficus cordifolia* Grah. Cat. 192. 1839 (non Roxb. 1832).

A glabrous, deciduous tree, 10–12 m tall, with greyish-white, smooth bark. Leaves 5–28 × 4.5–22.5 cm, broadly ovate, subcoriaceous. Receptacles 0.4–0.6 cm across, mostly from axils of fallen leaves, depressed-globose, smooth, purple, with greenish dots when ripe.

In deciduous forests (except Kutch); not frequent. (KHADAK PAYAR)

RECEPTACLES : Aug.–Feb.

Ficus asperrima Roxb. Fl. Ind. 3:554. 1832; FBI 5:522; C 3:153; S 258.

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6 12 m tall trees with smooth, grey bark and without aerial roots. Leaves 5–24.5 × 3.5–13.5 cm, entire or irregularly 3–lobed, coriaceous, ovate, obovate or broadly elliptic, scabrid. Receptacles 1–1.5 cm across, globose, hispid, solitary, axillary. Achenes obovoid–oblong, pale–brown, minutely tuberculate.

In deciduous forests of south and central Gujarat; not common. (KARVATI, KHAROTI, BHOI-UMBER)

RECEPTACLES : Nov.–July

Ficus benghalensis L. Sp. Pl. 1059. 1753; FBI 5:499; C 3:145; Bor 135; WI 4:24. f. 9; Ch & O 219; S & J 46; S 256.

Evergreen trees, 12–18 m tall, with straight trunk and grey to greyish–brown, rough bark. Leaves 7.5–24.5 × 5–16 cm, coriaceous, broadly ovate, ovate–oblong or elliptic. Receptacles 1.5–2.5 cm across, axillary, geminate, deep–orange–red, puberulous. Achenes reddish–brown, ovoid, glabrous.

Throughout; wild, self–sown or planted as a shade tree. (VAD)

REGEPTACLES : July–Mar.

Ficus carica L. Sp. Pl. 1059. 1753; C 3:155; Bailey 339; WI 4:26. Pl. 3 & ff. 11 & 12.

5–8 m tall trees, without aerial roots. Leaves 8–30 × 7.5–25 cm, broadly ovate, entire or lobed, softly pubescent beneath. Receptacles 1.2–3.5 cm across, axillary obovoid–oblong, thinly pubescent. Achenes shortly stipitate, oblong, pale–straw, glabrous except for hairy margins.

Planted at some places; cultivated in orchards in Bulsar district. (ANJIR)

RECEPTACLES : July–Oct.

Ficus drupacea Thunb. var. **pubescens** (Roth) Corner in Gard. Bull. Singapore 17:381. 1960; S 256. *Ficus mysorensis* Heyne ex Roth var. *pubescens* Roth in R. & S. Syst. 1:508. 1817. *Ficus mysorensis* Heyne ex Roth, Nov. Pl. Sp. 390. 1821; FBI 5:500; C 3:145 (p. p.).

An erect tree, densely tomentose in younger parts. Leaves 9–22.5 × 7.5–14 cm, ovate–oblong, or elliptic–oblong, brownish–tomentose beneath, petiolate. Receptacles 1.6–3.5 cm across, axillary, solitary or geminate, yellow, orange–yellow or red, with whitish or greenish spot, at length glabrescent or pubescent.

Listed by Patel R. I. (1971), who remarks "Cultivated along roads". (PIPLI).

RECEPTACLES : Mar.–June

Ficus heterophylla L. f Suppl. 442. 1781; FBI 5:518; C 3:152

1–2 m tall shrubs. Leaves 5–12 × 1.2–3.5 cm, ovate, ovate–lanceolate or oblong, scabrid, irregularly shallowly to deeply lobed.

In stony river beds at Dangs (Mahal).

RECEPTACLES : Not seen.

Ficus hispida L. f. Suppl 442. 1781; FBI 5:522; C 3:154; WI 4:36. f. 18; Ch & O 218.

Bushy shrubs or small trees, 3–7 m tall. Leaves 8.5–35 × 4–16 cm, ovate, obovate or obovate–oblong, coriaceous, hispid–tomentose beneath. Receptacles 1–2.2 cm across, greenish–yellow, obovoid or almost spherical, tomentose, densely on thickened margins, subsessile, mostly extra–axillary on leafless branches or on main trunk near the ground. Achenes straw–coloured or pale–to dark reddish–brown, ovoid, glabrous, minutely tubercled.

Throughout, a weed in waste places along roads, railway lines, river banks etc. (DHEDH UMARDO, RAMBAL, DHADHUMDI, JANGLI UMARDO, KALO UMARDO)

RECEPTACLES : Throughout the year.

Ficus microcarpa L. f. Suppl. 442. 1781; S & J 46; S 257. *Ficus retusa* auct. non L. 1753; FBI 5:51; C 3:146.

A large or medium sized, evergreen tree, with dark–grey bark. Leaves 7–9 × 3.5–5 cm, elliptic, ovate or obovate, rounded

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or bluntly acuminate at apex. Receptacles 0.6–1 cm across, sessile, paired, depressed-globose, smooth, yellowish-red.

Often planted along roads. (NANDRAK VAD, MAMLE SERI)

RECEPTACLES : Apr.–July

Ficus nervosa Heyne ex Roth, Nov. Pl. Sp. 338. 1821; FBI 5:512; C 3:147; S 257.

Trees, with dark-grey, smooth bark. Leaves 3–8 × 1.9–4.2 cm, oblong-lanceolate or oblanceolate, Receptacles creamy-white, pedunculate, axillary, prominently tuberculate.

Rajpipla (Piplod); very rare.

RECEPTACLES : Mar.

Ficus racemosa L. Sp. Pl. 1060. 1753; S & J 46; S 259. *Ficus glomerata* Roxb. Pl. Cor. 2:13. t. 123. 1798; FBI 5:535; C 3:154; WI 4:35. Pl. 4 (col.) & f. 17; Ch & O 220.

An evergreen tree, 10–15 m tall, with greyish or blackish-brown, rough, shallowly fissured bark. Leaves 5–15 × 2.5–6.5 cm, ovate to ovate-oblong or elliptic-lanceolate, glabrous at length. Receptacles 1.6–3.5 cm across, ovoid, subglobose or subturbinate, red, tomentose. Achenes reddish-brown, obovoid, minutely tuberculate.

Throughout, common. (UMARO, UMBAR, GULAR)

RECEPTACLES : Throughout the year.

Ficus religiosa L. Sp. Pl. 1059. 1753; FBI 5:513; C 3:149; Bor 135; WI 639. f. 21; Ch & O 219; S & J 46.

Trees, 10–16 m tall, with grey or greyish-black, rough bark. Leaves 6.5–30 × 5–19 cm, glabrous, subcoriaceous, ovate to ovate-rhomboid. Receptacles 0.6–0.8 cm across, spherical, reddish-purple, axillary or on leafless branches, geminate or clustered towards ends of branches.

Throughout, planted or self-sown. (PIPLO)

RECEPTACLES : Dec.–May

Ficus rumphii Bl. Bijdr. 437. 1825; FBI 5:512; C 3:148; WI 4:39; S 259.

Trees, 8–10 m tall. Leaves 7–15 × 4.5–10 cm, broadly ovate, glabrous. Receptacles 1–1.5 cm across, sessile, geminate, axillary or from old scars.

Patel R. I. (p. 259) listed it from south Gujarat forests. (PIPLI, PAYAR, PIPRI)

RECEPTACLES : Mar.–June

Ficus virens Ait. Hort. Kew 3:451. 1789; S & J 46; S 258. *Ficus infectoria* Roxb. Fl. Ind. 3:551. 1832; FBI 5:515; C 3:151. *Ficus lacor* auct. non Buch.-Ham.; WI 4:36. f. 19.

Small or medium-sized trees, with grey bark. Leaves 6.5–16 × 3.5–10 cm, ovate, ovate-lanceolate or elliptic-lanceolate, glabrous. Receptacles 0.7–1 cm across, axillary or on old wood, shortly pedunculate. Achenes dark-reddish-brown, ovoid-oblong, minutely papillate.

Throughout, along roads and in forests. (PIPLI)

RECEPTACLES : Oct.–June

MORUS L.

Morus alba L. Sp. Pl. 986. 1753; FBI 5:492; C 3:159; Bailey 337; WI 6:429. f 166; S & J 46; S 255.

2.5–6 m tall tree, with grey or greyish-yellow, smooth bark. Leaves 5.5–15 × 3.5–10 cm, broadly ovate, nearly glabrous, entire or lobed. Spikes 1.5–2.5 cm long, axillary, pendulous. Fruit light- to deep-violet or purple. Achenes brown, glabrous.

Cultivated. (SHETUR)

FLS & FRS : July–Dec.

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STREBLUS Lour.

Streblus asper Lour. Fl. Cochinch. 2:615. 1790; FBI 5:489; C 3:141; Cb & O 217. *Epicarpus orientale* Bl. Bijdr. 488. 1825; Wt. Icon. t. 1961.

An evergreen tree, 5–8 m tall, often with crooked trunk and rough, light-greyish-brown, slightly irregularly fissured bark. Leaves 1.2–8 × 0.9–4.8 cm, coriaceous, elliptic or obovate, subsessile, shortly acuminate at apex, tapering at base. Flowers dioecious, axillary, males in pedunculate head, female solitary. Drupes 0.6–0.8 cm across, pysiform or ellipsoid, orange or reddish-yellow.

Throughout in scrub forests and in open places in dry deciduous forests; rather not common. (HARERO)

FLS & FRS : Mar.–July

CANNABACEAE 117

CANNABIS L.

Cannabis sativa L. Sp. Pl. 1027. 1753; FBI 5:487; C 3:160; S & J 46; WI 2:59. ff. 30 31; Bailey 341.

Erect herbs, upto 1.5 m tall. Leaves 3–8-foliolate; leaflets 3–8 cm long, linear-lanceolate or lanceolate, glabrous.

North Gujarat (Pahada) and Saurashtra; cultivated surreptitiously. (GANJO)

FLS & FRS : Not seen.

CASUARINACEAE 118

CASUARINA L.

Casuarina equisetifolia L. Amoen. Acad. 4:143. 1759; FBI 5:859; C 3:161; WI 2:101. Pl. 8; Bailey 316. f. 43; Bor 127; S & J 47; S 261.

Evergreen trees, 10–12 m tall, with brown to blackish-brown bark; branches slender, 6–10-ribbed, glaucous-to dark-green. Leaves reduced to scales, in whorls of 6-8. Male spikes

1–2.5 cm long, terminal. Female fascicles globose or ovoid at ends of lateral branches. Nuts winged, minute, crowded into a woody cone.

Extensively planted along sea shores for soil reclaimation; also an ornamental. (SHARU)

FLS & FRS : Throughout the year.

SALICACEAE 119

SALIX L.

Salix tetrasperma Roxb. Pl. Cor. 1:66. t. 97. 1795; FBI 5:626; C 3:162; WI 9:174. f. 54; S 261.

Trees, 4–12 m tall, with rough, longitudinally fissured bark. Leaves 3–11 × 0.5–1.2 cm, lanceolate or ovate-lanceolate, glaucous and silky-pubescent beneath. Spikes 2–7.5 cm long, axillary. Capsule ovoid, glabrous, two-valved. Seeds 4–6, with penicillate funicle.

In stony river beds at Dangs, Vyara, Rajpipla, Broach, Panchmahals and north Gujarat (Khedbrahma); rare.

FLS & FRS : Nov.–Dec.

CERATOPHYLLACEAE 120

CERATOPHYLLUM L.

Ceratophyllum demersum L. Sp. Pl. 992. 1753; FBI 5:639; C 3:165; WI 2:122; S 261.

Submerged, rootless, monoecious, slender herbs. Leaves verticillate, mostly twice forked; segments linear or filiform, dentate. Flowers minute, axillary, solitary. Fruit straw-coloured, tuberculate, with 3 spines.

Panchmahals (Tuwa) and Bulsar, in ponds.

FLS & FRS : Sep.–Nov.

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HYDROCHARITACEAE

Key to genera

1. Leaves radical :
   2. Leaves broadly ovate-oblong or suborbicular, peticlate; flowers bisexual; fruit winged.. .. ..*Ottelia*
   2. Leaves linear, sessile; flowers unisexual or bisexual; fruits not winged :
      3. Perianth single.. .. ..*Vallisneria*
      3. Perianth double.. .. ..*Blyxa*
1. Leaves cauline :
   4. Leaves whorled.. .. ..*Hydrilla*
   4. Leaves alternate or opposite but not whorled.. .. ..*Nechamandra*

BLYXA Thouars.

Key to species

1. Flowers hermaphrodite; seeds spinescent with long tails.. .. ..*B. echinosperma*
1. Flowers dioecious; seeds tuberculate with short tails.. .. ..*B. octandra*

Blyxa echinosperma (Cl.) Hk. f. in Hk. f. FBI 5:661. 1888; C 3:172. *Hydrotrophus echinospermus* Cl. in Journ. Linn. Soc. 14:8. t. 1. 1875.

Submerged, aquatic, rooted herbs. Leaves 13–45×0.6–1 cm, glabrous. Flowers white, minute, solitary, at end of scape. Capsule 5.5–7 cm long, linear, terete, many–seeded. Seeds straw–coloured, spinescent, with a long, filiform process at each end.

Dharampur and Bulsar, in ponds.

FLS & FRS : Nov.–Dec.

Blyxa octandra (Roxb.) Planch. ex Thw. Enum. Pl. Zeyl. 332. 1864; S & J 47; S 262. *Vallisneria octandra* Roxb. Pl. Cor. 2:34. t. 165. 1798. *Blyxa roxburghii* Rich. in Mem. Inst. Fr. 77. t. 5. 1811; FBI 5:660; C 3:172.

Submerged, rooted. Leaves 20–40×0.6 1.5 cm, flaccid. Flowers white, males on scape as long as or longer than leaves.

Saurashtra.

FLS : Dec.–Feb.

HYDRILLA L. C. Rich

Hydrilla verticillata (L. f.) Royle, Illus. Bot. Himal. t. 376. 1839; FBI 5:659; C 3:170; WI 5:145; S & J 47. *Serpicula verticillata* L. f. Suppl. 416. 1781.

Slender, submerged, free floating or rooting herbs. Leaves 0.6–1.8 cm long, linear to linear–oblong, glabrous. Flowers white, minute, dioecious, solitary, axillary, on filiform peduncle.

Throughout; common.

FLS & FRS : Oct.–Dec.

NECHAMANDRA Planch.

Nechamandra alternifolia (Roxb.) Thw. Enum. Pl. Zey. 332. 1864; S & J 47; S 262. *Vallisneria alternifolia* Roxb. Hort. Beng. 71. 1814 (nomen) & Fl. Ind. 3:750. 1832. *Lagerosiphon roxburghii* Bth. ex Hk. f. in Hk. f. FBI 5:659. 1888; C 3:170.

Slender, submerged, rooted, flaccid herbs. Leaves 3–7.6 cm long, linear–lanceolate to oblong-lanceolate, sessile. Flowers minute, axillary, sessile, in spathe. Stamens 2.

Throughout in ponds (except Kutch), restricted in distribution; not common.

FLS & FRS : Oct.–Dec.

OTTELIA Pers.

Ottelia alismoides (L.) Pers. Syn. Pl. 1:400. 1805; FBI 5:662; C 3:173; WI 7:194. f. 74; S & J 47. *Stratiotes alismoides* L. Sp. Pl. 535. 1753.

Aquatic, flaccid, rooting, submerged herbs. Leaves 5–17× 3.3–21 cm, dark-green, glabrous. Flowers white, axillary,

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solitary. Capsule 2-3.7×0.8–1.5 cm, ellipsoid, crowned by persistent, withered perianth.

Dharampur, Bulsar, Dangs, Chhotaudepur, Panchmahals, north Gujarat and Saurashtra; not common.

FLS & FRS : Oct.–Mar.

VALLISNERIA L.

Vallisneria spiralis L. Sp. Pl. 1015. 1753; FBI 5:660; C 3:171; S & J 47; S 262.

Submerged, rooted, stoloniferous herbs. Leaves variable in length, erect, glabrous. Male flowers many, minute, in compact, ovoid or conical head, on short, axillary scape. Female flower solitary, on long, coiled scape. Fruits 1–1.3 cm long.

Throughout in stagnant water; common.

FLS & FRS : Dec.–Feb.

ORCHIDACEAE

Key to genera

1. Epiphytes :
   2. Plants with distinct pseudobulbs.. .. ..*Dendrobium*
   2. Plants without pseudobulbs :
      3. Plants without a distinct stem; leaves radical.... *Oberonia*
      3. Plants with a distinct stem; leaves cauline :
         4. Leaf apex irregularly 1–3-toothed .. .. *Vanda*
         4. Leaf apex bilobed, lobes unequal or subequal, rounded or subacute .. .. *Aerides*
1. Terrestrials :
   5. Leaf one and rugose above .. .. *Nervilia*
   5. Leaves more than one, not rugose :
      6. Lip spurred, spur projecting beyond lateral sepals :
         7. Flowers 7-7 5 cm across, greenish-white; stigmatic surfaces flat, almost confluent .. .. *Platanthera*
         7. Flowers not more than 3 cm across, green or white; stigmatic surfaces not flat, separate :

8. Ovary and capsules more or less erect and parallel to peduncle, not spreading at an angle to it; stigmatic surfaces in the form of small swellings on edge of lip .. .. .. *Peristylus*
8. Ovary and capsules widely spreading at an angle to peduncle; stigmatic lobes standing out as stalked appendages .. .. *Habenaria*

6. Lip not spurred, often saccate at base; sac never projecting beyond lateral sepals :
   9. Plants with subterranean pseudobulbs; pollinia 4 .. .. *Malaxis*
   9. Plants with a rhizome; pollinia 2... .. *Zeuxine*

AERIDES Lour.

Key to species

1. Sepals and petals spotted; lateral lobes of lip minute, rounded; middle lobe 1.2–1.4 cm long.. .. ..*A. maculosum*
1. Sepals and petals not spotted; lateral lobes of lip 0.7–0 9 cm long, narrowly oblong; middle lobe 2–2.2 cm long ... .*A. crispum*

Aerides crispum Lindl. Gen. & Sp. Orch. 239. 1833 (cum descr.); FBI 6:45; C 3:203; Santapau & Kapadia, Orch. Bombay 122. 1966; S 267. *Aerides lindleyana* Wt. Icon. 5 (i): 9. t. 1677 bis. 1851.

Herbs. Leaves 7–24×1.6–3 cm, thickly coriaceous, oblong, glabrous. Flowers rosy-pink, in 10–30 cm long racemes. Capsule. 3–3.5 cm long, oblong–elliptic, strongly ridged.

Chhotaudepur (Luni forests); reported by Thaker et al. (1970).

FLS : July

Aerides maculosum Lindl. in Bot. Reg. t. 58. 1845 & Gard. Chron. 691. 1845; FBI 6:45; C 3:203; Ch & O 220; Santapau & Kapadia 121, Pl. 30; S 267. *Saccolabium speciosum* Wt. Icon. 5(1):9. tt. 1674–75. 1851.

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Herbs. Leaves 5.5–20×0.5–3 cm, coriaceous, linear-oblong or oblong. Flowers 1.5-2 cm across, mildly fragrant, deep-rosy-pink or mauve, in 5-20 cm long, simple or branched racemes. Capsule 2.5–5×0.8–1 cm, obovoid, strongly ribbed.

Dangs and Pavagadh; occasional in Dangs. (LASUN)

FLS : May–July *FRS* : June–Dec.

DENDROBIUM Sw. nom. cons.

Key to species

1. Plants small, with crowded, ovoid pseudobulbs; petals not broader than dorsal sepal :
   2. Leaves fleshy, coriaceous; peduncles very short; mid-lobe acute.. .. ..*D. peguanum*
   2. Leaves thin, membranous; peduncles 4–5 cm long, filiform, slender; mid-lobe obtuse or retuse.. *D microbulbon*
1. Plants large, with elongate pseudobulbs; petals much broader than the dorsal sepal :
   3. Flowers creamy-yellow, 1.3–1.5 cm across; lip 0.6–0.8 cm long; disc hairy all round; mid-lobe somewhat quadrate-rounded.. .. ..*D. ovatum*
   3. Flowers white, or tinged pink or pale-lilac, 2.5–4 cm across; lip 2.3–3 cm long, disc hairy at base and apex only; mid-lobe ovate or ovate-oblong, rarely subflabellate .. ..*D. barbatulum*

Dendrobium barbatulum Lindl. Gen. & Sp. Orch. 84. 1830; FBI 5:719; C 3:184; Santapau & Kapadia 93. Pl. 22; S 264.

Stem 5–35 cm long, bulbous at base, narrowed at apex. Leaves 4.5–13×1.5–3.5 cm, lanceolate to ovate-lanceolate. Flowers in 8–22 cm long, terminal and lateral racemes. Capsule 2–2.2×1–1.2 cm, elliptic or obconical.

Dangs (Ahwa, Malegaon); not frequent.

FLS : Jan.–May *FRS* : Mar.–July

Dendrobium microbulbon A. Rich. in Ann. Sc. Nat. Ser. II. 15:19. t. 8. 1841; FBI 5:716; C 3:183; Santapau & Kapadia 87. Pl. 19; S 263. *Callista microbulbon* (A. Rich.) O. Ktze. Rev. Gen. Pl. 2:255. 1891. *Dendrobium humile* Wt. Icon. 5(1):5. t. 1643. 1851.

Pseudobulbs 0.5–1.5 cm across, broadly ovoid. Leaves 2–14×0.3–1.3 cm, linear-lanceolate to oblong-lanceolate, mostly leafless at flowering time. Flowers 1.2–1.4×1–1.1 cm, white, in 3–10 cm long racemes. Capsule 0.9–1×0.5–0.6 cm, ovoid.

Dangs (Malegaon, Ahwa); rare but locally abundant.

FLS : Dec. *FRS* : Jan.–May

Dendrobium ovatum (Willd.) Kranz in Pfreich. 45:71. 1910; Santapau & Kapadia 91. Pl. 21; S 264. *Cymbidium ovatum* Willd. Sp. Pl. 4:101. 1805. *Dendrobium chlorops* Lindl. in Bot. Reg. Misc. 44. 1844; FBI 5:719; C 3:184.

Stem tufted, 20–40 cm long, bulbous at base. Leaves 5–11×1.2–3 cm, elliptic-oblong or oblong-lanceolate, glabrous. Flowers in 3–10 cm long, terminal and lateral racemes. Capsule 1.6–1.8×0.6–0.8 cm, oblong-ovoid, purple, ribbed.

Dangs (Subir), rare.

FLS : Feb. *FRS* : Feb.–Mar.

Dendrobium peguanum Lindl in Journ Linn. Soc. 3:19. 1859; Santapau & Kapadia 84. Pl. 18. *Dendrobium pygmaeum* Lindl. Gen. & Sp. Orch. 85. 1830; FBI 6:717. (non Sm. ex Rees 1828). *Dendrobium microbulbon* Blatt. & McC. in Journ. Bombay nat. Hist. Soc. 35:262. f. 7. 1931 (p. p., non A. Rich. 1845).

Pseudobulbs 1–6 cm long, ovoid-conical to oblong-ovoid. Leaves 2.5–5×0.6–2 cm, broadly elliptic or elliptic-oblong. Flowers 1–1.2 cm long, in 5–7 cm long racemes. Capsule 0.5–0.7×0.4–0.5 cm, ribbed.

Dangs (Pimpri, Ahwa); not frequent.

FLS : Oct.–Dec. *FRS* : Dec.–Mar.

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HABENARIA Willd.

Key to species and varieties.

1. Petals 2 partite :
   2. Leaves 1-2, flat on ground; dorsal segment of petals much longer than upper ones .. .. .. *H. grandifloriformis*
   2. Leaves arranged from above the middle of stem; segments of petals subequal .. .. *H. gibsonii* var. *foliosa*
1. Petals entire :
   3. Ovary long beaked; petals broad, oblong; lip segments filiform.. .. .. *H. commelinifolia*
   3. Ovary not beaked; lip segments not filiform :
      4. Lateral lobes of lip broader than middle lobe, obliquely truncate, denticulate; spur 9–12 cm long; flowers white .. .. *H. longicorniculata*
      4. Lateral lobes of lip not broader than middle lobe, linear–oblong to linear–filiform; flowers green or white; spur not more than 5 cm long :
         5. Leaves clustered about middle of stem; flowers green .. .. *H. furcifera*
         5. Leaves radical, subradical or cauline; flowers yellow :
            6. Leaves cauline .. *marginata* var. *fusifera*
            6. Leaves radical or subradical .. .. .. *marginata* var. *marginata* forma *marginata*

Habenaria commelinifolia Wall. ex Lindl. Gen. & Sp. Orch. 325. 1835; FBI 6:143; C 3:224; Santapau & Kapadia 25. Pl. 4. ff. 11–12.

Tuberous herbs. Leaves 6–20 × 1.5–3.5 cm, oblong-lanceolate, glabrous. Flowers greenish–white, sessile, bracteate, in short, terminal racemes.

Bulsar (Palnera hills); rare.

FLS : Aug -Sep.

Habenaria furcifera Lindl. Gen. & Sp. Orch. 319. 1835; FBI 6:149; Santapau & Kapadia 39. Pl. 5. f. 20.

Tuberous, 40–60 cm tall herbs. Leaves 13–17 × 3–6 cm, oblanceolate, obovate or elliptic. Flowers small, shortly stalked, in 20–40 cm long, erect, stout, bracteate spikes. Capsule 1.5 × 0.5 cm, fusiform, turgid, decurved with strong ribs.

Dangs (Waghai, Ahwa).

FLS : Aug.–Sep. *FRS :* Sep.–Nov.

Habenaria gibsonii Hk. f. var. **foliosa** (A. Rich.) Santapau & Kapadia in Journ. Bombay nat. Hist. Soc. 56:194. 1959 & Orch. Bombay 14. Pl. 5. f. 6. 1966; S 269. *Habenaria foliosa* A. Rich. in Ann. Sci. Nat. Ser. II. 15:71. t. 3A. 1841; Wt. Icon. t. 1700. *Habenaria digitata* Lindk var. *foliosa* (A. Rich.) Hk. f. in Hk. f. FBI 6:135. 1890; C 3:220.

Tuberous herbs, 20–40 cm tall, leafy near apex. Leaves 3-11x1.5-5 cm, elliptic–oblong or ovate–oblong, membranous. Flowers 1.4–1.8 cm across, white, in 5–10 cm long, bracteate racemes. Fruits not seen.

Dangs (Malegaon), Rajpipla, Chhotaudepur, Bulsar; rare in dense, rocky undergrowth on hilly slopes or in shaded spots in plains.

FLS : July

Habenaria grandifloriformis Blatt. & McC. in Journ. Bombay nat. Hist. Soc. 36:17. 1932, charact. emend Santapau & Kapadia 17. Pl. I. ff. 2-2'. *Habenaria grandiflora* Lindl. ex Dalz. & Gibs. Bombay Fl. 267. 1861; FBI 6:136; C 3:221. (non Torr. ex Beck. 1823). *Habenaria rotundifolia* Lindl. Gen. & Sp. Orch. 306. 1835 (non A. Rich. 1823).

Tuberous herbs. Leaves opposite, 1.7–8.3 × 1.2–5.4 cm, broadly ovate. Flowers white, few, in short, terminal, lax racemes. Capsule 2.5–2.8 cm long, strongly ribbed.

Dangs (Malegaon, Saputara); common.

FLS : July *FRS* : Aug.

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Habenaria longicorniculata Grah. Cat. Bombay Pl. 202. 1839; Santapau & Kapadia 29. Pl. 1. ff. 1–1'; S 270. *Habenaria longecalcarata* A. Rich. in Ann. Sci. nat. Ser. II. 15:71. t. 3B. 1841; Wt. Icon. t. 925. *Habenaria longecalcarata* A. Rich. var. *viridis* Blatt. & McC. in Journ. Bombay nat Hist. Soc. 36:20. 1932.

40-90 cm tall, tuberous herbs. Leaves only at base, 5-15 × 1.5-3.5 cm, oblong, lanceolate or elliptic-lanceolate, glabrous. Flowers few, white, scented, in lax racemes. Capsule 2.5-3 cm long, fusiform.

Dangs (Malegaon), rare in dense forest undergrowth.

FLS : Aug.-Sep. *FRS* : Oct.

Habenaria marginata Coleb. var. **fusifera** (Hk. f.) Santapau & Kapadia in Journ. Bombay nat. Hist. Soc. 56:199. 1959 & Orch. Bombay 35.1966. *Habenaria fusifera* Hk. f. in Hk. f. FBI 6:147. 1890.

This variety differs from var. *marginata* in having cauline leaves, lax inflorescence and spur shorter than ovary.

Dangs (Dungarda).

FLS : Sep.

Habenaria marginata Colebr. var. **marginata** forma **marginata**. *Habenaria marginata* Colebr. in Hk. Exot. Fl. t. 136. 1825; FBI 6:150; C 3:226; Santapau & Kapadia 33. Pl. 5. f. 17.

Tuberous herbs, 8-45 cm tall. Leaves 2–5, clustered at base, radical or subradical, 3–10 × 1.5–3 cm, elliptic-oblong, ovate to ovate-lanceolate. Flowers greenish-yellow, in 5.5–12.6 cm long, lax or compact, terminal spikes. Fruits not seen.

Sanjan, Bulsar, Dangs, Chhotaudepur, Panchmahals; rare.

FLS & FRS : Aug.-Sep.

MALAXIS Soland. ex Sw.

Malaxis mackinnonii (Duthie) Ames in Orchid. 6:289. 1920; Santapau & Kapadia 140. *Microstylis mackinnonii* Duthie in Journ. As. Soc. Beng. (Ser. II.) 71:37. 1902 & Ann. Roy. Bot. Gard. Calcutta 9(2):88. t. 95. 1906 & Fl. Up. Gang. Pl. 3:184. 1920 & 2:269 1960 (reprinted). *Microstylis cardonii* Prain, Bengal Pl. 1004. 1903 & 754. 1963 (reprinted); Haines, Bot. Bihar & Orissa 1165. 1924 & 1217. 1961 (reprinted).

Herbs. Leaves 1–3, spreading on the ground, subfleshy, subplicate. 3-13 × 1.3–7 cm, oblong, lanceolate, elliptic–oblong, ovate-lanceolate or broadly ovate, rarely suborbicular. Flowers 3–4 cm across, pale–yellow or yellowish–green, in terminal racemes. Capsules 0.8–1 × 0.2–0.4 cm, erect, obovoid, ridged.

Dangs (Waghai); locally abundant.

FLS : Aug.-Sep. *FRS* : Sep.–Nov.

NERVILIA Comm. ex Gaud. (nom. cons.

Key to species

1. Leaves flat on ground, hairy; petioles 2–5 cm long; scape 2-flowered .. .. *N. discolor*
1. Leaves raised above the ground, glabrous; petioles 8–20 cm long; scape several flowered .. .. *N. aragoana*

Nervilia aragoana Gaud. in Bot. Voy. Freyc. 422. t. 36. 1826; Santapau & Kapadia 134. *Pogonia flabelliformis* Lindl. in Wall. Cat. 7400. 1832 (nomen) & Gen. & Sp. Orchid. 415. 1840; FBI 6:121. *Pogonia carinata* Wt. Icon. 5(1):15. t. 1720. 1851; C 3:211 (non Lindl. 1840). *Pogonia scottii* Reichb. f. in Flora 276. 1872; FBI 6:120. *Nervilia scottii* (Reichb. f.) Schltr. in Bot. Jahrb. 45:404. 1911.

Tuberous, acaulescent herbs. Leaf broadly ovate or almost orbicular. Flowers 2–3 cm long, greenish-yellow or brownish-yellow, drooping, in lax, terminal racemes.

Dangs (Malegaon, Ahwa), in shaded spots; not common.

FLS : June

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Nervilia discolor (Bl.) Schltr. in Bot. Jahrb. 45:403. 1911; Santapau & Kapadia 131. Pl.32. *Cordyla discolor* Bl. Bijdr. 417. 1825, *Pogonia discolor* (Bl.) Bl. Mus. Bot. Lugd.-Bat. 1:32. 1849 & 128, t. 57. 1858. *Pogonia biflora* Wt. Icon. 5(1):22. t. 1758. 1851; FBI 6:110. *Nervilia biflora* (Wt.) Schltr. in Bot. Jahrb. 45:403. 1911.

Acaulescent, tuberous herbs. Leaf 4.3-10.5×4.5-11.5 cm, broadly ovate to almost orbicular, plicate, yellowish-brown.

Dangs (Malegaon, Subir); not frequent.

FLS and/or *FRS* : Not seen.

OBERONIA Lindl. nom. cons.

Oberonia falconeri Hk. f. Icon. Pl. t. 1780. 1888; FBI 5:678; C 3:178; Santapau & Kapadia 65. Pl. 11 A-B.

Erect or pendulous. Leaves 2-9×0.5-1 cm, coriaceous, oblong-lanceolate. Flowers 0.1-0.2 cm across, greenish-yellow, 2-14 cm long, lax, erect or curved racemes. Capsule 0.35-0.4×0.15-0.2 cm, obovoid, strongly ribbed.

Dangs (Susarda, Waghai); not frequent.

FLS : Sep. *FRS* : Oct.-Dec.

PERISTYLUS Bl. nom. cons.

Key to species

1. Spur as long as or longer than speal, linear, subclavate.. .. .. *P. stocksii*

1. Spur much shorter than sepal, saccate, subglobose :

2. Flowers white; lip shorter than broad sepals, entire or scarcely 3-lobed.. .. .. *P. plantagineus*

2. Flowers yellow or yellowish-green; lip about as long as sepals, distinctly 3-lobed :

3. Spikes dense; lateral sepal mucronate at back a little below apex.. .. .. *P. goodyeroides*

3. Spikes lax; lateral sepals not mucronate.. .. *P. lawii*

Peristylus goodyeroides (D. Don) Lindl. Gen. & Sp. Orch. 299. 1835; Santapau & Kapadia 52. *Habenaria goodyeroides* D. Don, Prodr. Fl. Nep. 25. 1825; FBI 6:161. *Peristylus goodyeroides* Lindl. var. *affinis* Lindl. Gen. & Sp. Orch. 300. 1835; C 3:216.

Herbs, 30-37 cm tall. Leaves clustered about lower third of stem, 7-11×4-4.5 cm, broadly ovate-elliptic or elliptic, sessile. Flowers ±1 cm long, in terminal, bracteate spikes.

Chhotaudepur (Thaker et al. 1970-71).

FLS : Sep.

Peristylus lawii Wt. Icon. 5:12. t. 1695. 1851; C 3:216; Santapau & Kapadia 53. Pl. 10E-D. *Habenaria lawii* Hk. f. in Hk. f. FBI 6:162. 1890.

Herbs, 15-45 cm tall, tuberous, stout. Leaves 3-5, clustered about middle, lanceolate or oblong-lanceolate, glabrous, sessile. Flowers sessile, white, tinged greenish-yellow, bracteate in 8-18 cm long, terminal, lax spikes. Capsule fusiform, ribbed, 1-1.5 cm long, shortly beaked.

Dangs (Waghai) and Rajpipla; rare.

FLS : July-Aug. *FRS* : Sep.

Peristylus plantagineus Lindl. Gen. & Sp. Orch. 300. 1835; C 3:216; Santapau & Kapadia 51. Pl. 10A-B. *Habenaria wightii* Trim. Cat. Ceyl. Pl. 91. 1885; FBI 6:162.

40-45 cm tall, tuberous, robust herbs. Leaves 4-8, clustered about middle of stem, 7-23×2-9 cm, oblong, oblong-lanceolate, elliptic or elliptic-ovate, sessile, glabrous. Flowers sessile, bracteate, in 9-22 cm long, compact, terminal spikes.

Dangs (Waghai, Subir); rare.

FLS : July-Aug.

Peristylus stocksii (Hk. f.) Kranz. Orch. Gen. & Sp. 1:513. 1898; C 3:215; Santapau & Kapadia 48. Pl. 9C-D; S 268. *Habenaria stocksii* Hk. f. in Hk. f. FBI 6:158. 1890.

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10-75 cm tall, tuberous herbs. Leaves 5-14×2-4 cm, clustered about the middle or scattered on stem, obovate-elliptic, elliptic-lanceolate to oblong. Flowers sessile, bracteate, in terminal, 9-24 cm long, subsecund, twisted spikes.

Dangs (Waghai); rare, in the forest undergrowth.

FLS : July-Sep. *FRS* : Aug.-Oct.

PLATANTHERA L. C. Rich. nom. cons.

Plantanthera susannae (L.) Lindl. Gen. & Sp. Orch. 295. 1835; C 3:217; Santapau & Kapadia 42. Pl. 7-8; S 268. *Orchis susannae* L. Sp. Pl. 939. 1753. *Habenaria susannae* (L.) R. Br. ex Spreng. Syst. Veg. 3:622. 1826; FBI 6:137.

Stout, 60-75 cm tall, tuberous herbs Leaves 5-18×2-7 cm. ovate-oblong or oblong-lanceolate, glabrous with faint, yellowish margin, sessile. Flowers faintly fringed, 2-6, in 16-20 cm long, terminal, bracteate racemes. Capsule 4.5×1.5 cm, ellipsoidal, strongly ribbed, beaked.

Dangs (Waghai, Suasarda); rare.

FLS : Aug.-Oct. *FRS* : Sep.-Dec.

VANDA R. Br.

Key to species

1. Sepals and petals pale-yellow, 0.6-0.8 cm long; capsule, 2.5-4×0.7-1 cm.. .. ..*V. testacea*

1. Sepals and petals greenish-yellow, somewhat brown, tessellated on upper surface, lower being pure-white, 2.3-2.5 cm long; capsule 6-8×1.2-1.5 cm .. ..*V. tessellata*

Vanda tessellata (Roxb.) Hk. f. ex G. Don in Lond. Hort. Brit. 372. 1830; Santapau & Kapadia 220. Pl. 51. *Epidendrum tessellatum* Roxb. Pl. Cor. 1:34. t. 42. 1795. *Vanda roxburghii* R. Br. Bot. Reg. 6: t. 506. 1820; FBI 6:52; C 3:208.

Herbs. Leaves 5-25×0.4-1.2 cm, linear-oblong, coriaceous. Flowers 4-5 cm across, in 2-10-flowered racemes, usually longer than leaves. Capsule oblong, sharply winged.

Vyara, Chhotaudepur, Rajpipla, Panchmahals; rare but locally abundant.

FLS : Mar.-June *FRS* : Apr.-Dec.

Vanda testacea (Lindl.) Reichb. f. in Gard. Chron. II : 166. 1877; Santapau & Kapadia 219. *Aerides testaceum* Lindl. Gen. & Sp. Orch. 238. 1833. *Vanda spathulata* Grah. Cat. Pl. Bombay 204. 1839 (non Spr. 1826). *Vanda parviflora* Lindl. in Bot. Reg. 30. Misc. 45. 1844; FBI 6:50; C 3:207.

Herbs. Leaves 4.5-16×0.4-1.2 cm, oblong or linear-oblong, coriaceous. Flowers few, in terminal racemes. Capsule fusiform, elliptic-oblong, ribbed.

Bulsar, Dangs and Chhotaudepur; rare.

FLS : May-June *FRS* : July-Dec.

ZEUXINE Lindl. nom. cons.

Zeuxine strateumatica (L.) Schltr. Fedde Repert. Beith. 1:77. 1911; Santapau & Kapadia 167. Pl. 38; S & J 47. *Orchis strateumatica* L. Sp. Pl. 943. 1753. *Zeuxine sulcata* Lindl. Gen. & Sp. Orch. 485. 1840 & in Journ. Linn. Soc. 1:186. 1857; FBI 6:106; C 3:213

Herbs, 7-20 cm tall. Leaves several, 1.8-9×0.3-0.8 cm, linear to linear-lanceolate. Flowers white, sessile, bracteate, in dense, spirally arranged, secund spikes. Capsule broadly ovoid, beakless, strongly ribbed.

Thoughout, among grasses (except Kutch); rather rare.

FLS & FRS : Jan.-Mar.

Feb. 219 Talab Lakhar Lake

ZINGIBERACEAE 123

Key to genera

1. Anthers one celled.. .. ..*Alpinia*

1. Anthers two celled :

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2. Inflorescence terminal in a spiral on twisted stem..*Costus*

2. Inflorescence not terminal on a leafy twisted stem :

3. Leaves tufted.. .. ..*Curcuma*

3. Leaves distichous on a pseudo-stem, separate from efoliate inflorescence.. .. .. .. *Zingiber*

ALPINIA Roxb. nom. cons.

Alpinia nutans (L.) Roscoe in Sm. Exot. 2:93. 1805 & Trans. Linn. Soc. 8:346. 1807; FBI 6:256; C 3:245. *Globba nutans* L. Mant. 2:170. 1771. *Alpinia speciosa* K. Schum. in Engl. Bot. Jahrb. 27:284. 1900; WI 1:63; Bailey 289.

2.5–3 m tall undershrubs. Leaves 18–30×3–5 cm, oblong-lanceolate or elliptic-lanceolate, glabrous. Flowers white with a pinkish-tinge and lip variegated red and yellow, in 10–15 cm long, terminal spike. Fruits not seen.

Ornamental.

FLS : Mar.-Apr.

COSTUS L.

Costus speciosus (Koenig ex Retz.) Sm. in Trans. Linn. Soc. 1:249. 1791; FBI 6:249; C 3:243; WI 2:361. f. 132; S 276. *Banksia speciosa* Koenig ex Retz. Obs. 3: 75. 1783.

1–1.5 m tall, perennial herbs, with slender, glabrous stems. Leaves 10-30×4.5-8.5 cm, oblanceolate or oblong-lanceolate, appressed-hairy beneath. Flowers 5–8 cm across, white, in terminal, compact spike. Capsules 1.5–2 cm long, obtusely trigonous, deep-red. Seeds greyish-black, smooth, glabrous.

Dangs, Vyara, Vansada, Rajpipla, Chhotaudepur; rather rare in the forest under-growth. (PAYUTA)

FLS : Aug.-Sep. *FRS* : Sep.-Dec.

CURCUMA L.

Key to species

1. Corolla purplish with a yellow streak on the lip; tubers white inside.. .. .. *C. inodora*

1. Corolla pale-to bright-yellow or whitish; tubers yellow inside :

2. Root-stock small, bearing tubers at ends of root fibres.. .. ..*C. pseudomontana*

2. Root-stock large, bearing sessile tubers.. ..*C. amada*

Curcuma amada Roxb. in As. Res. 11:341. 1810; FBI 6:213; C 3:237; WI 2:401.

Perennial. rhizomatous herbs; rhizomes tuber bearing. Leaves 30–50×7–15 cm, oblong-lanceolate. Spikes 7–15×4–6 cm, central, on long scape; bracts green to greenish-white.

Cultivated in Gujarat (see also Cooke). (AMBA HALDAR)

FLS : Aug.-sep.

Curcuma inodora Blatt. in Journ. & Proc. As. Soc. Bengal (N. S.) 26:357–358. 1930; Ch & O 221; S & J 47.

Tuberous, perennial herbs. Leaves radical, 10–50×5–17 cm, broadly elliptic-lanceolate, glabrous. Flowers 2–2.5×1.2–1.8 cm, in 10–20 cm long spikes. Capsule 3-valved with arillate seeds.

Throughout (except Kutch); common, in shaded spots and in the forest undergrowth.

FLS : June–Sep. *FRS* : Aug.-Nov.

Curcuma pseudomontana Grah. Cat. Pl. Bombay 210. 1839; C 3:236; WI 2:406, Ch & O 222; S 273. *C. montana* Baker in Hk. f. FBI 6:214. 1890 (p. p. non Roscoe).

Scapigerous, rhizomatous herbs; rhizomes tuber bearing. Leaves 16–25×6–10 cm, petiolate. Spikes 6–9×4–7 cm, at first lateral and then central ones arise, pedunculate.

Pavagadh, near Machi; in rocky ground; rather rare.

FLS : July–Aug.

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ZINGIBER Boehm. nom. cons.

Zingiber cernuum Dalz. in Hk. Kew Journ. Bot. 4:342. 1852; FBI 6:245; C 3:240; S 274.

Perennial herbs, 1–1.5 m tall, with strongly aromatic rhizome. Leaves 50–60×6–8 cm, oblong-lanceolate, glabrous. Spikes terminal, 10–12 cm long. Capsule 4–4.5×1.5–1.7 cm, trigonous, deep-red. Seeds oblong, angled, dark-red, arillate.

Seen in fruits at Dangs (Mahal) in the forest undergrowth; rare. (JANGLI ADU)

FLS : Jan.–Feb.

MUSACEAE 124

Key to genera

1. Plants cultivated; stoloniferous .. .. *Musa*
1. Plants wild, not stoloniferous .. .. *Ensete*

ENSETE Horan.

Ensete superbum (Roxb.) Cheesman in Kew Bull. 1947:100. 1948; S 277 *Musa superba* Roxb. Fl. Ind. 2:489. 1824; FBI 6:261; C 3:247.

3-6 m tall, tree like herbs. Leaves 1.5-3×0.5-1 m oblong, tapering at base.

This species occurs in Pavagadh and Dangs; not common.

FLS & FRS : Not seen.

Musa paradisiaca L. Sp. Pl. 1043. 1753; C 3:249; Cheesman in Kew Bull. 1947:148. 1948; Bailey 286; WI 6:452. Pl. 13 & 14 & f. 177. *Musa sapientum* L. var. *paradisiaca* (L.) Backer in Ann. Bot. 7:213. 1893; FBI 6:262.

A stoloniferous herb, 2–6 m tall; stem false of sheathing leaf bases. Leaves large, oblong to elliptic-oblong, glabrous. Inflorescence usually drooping. Bracts dull-purplish outside, dark-red to purplish-red inside, cymbiform, many-flowered. Fruits oblong, somewhat angular.

Throughout; some varieties are cultivated in Gujarat. (KELA)

FLS & FRS : Throughout the year.

CANNACEAE 125

CANNA L.

Canna indica L. Sp. Pl. 1. 1753; FBI 6:260; C 3:251; S & J 47; S 277.

Perennial, rhizomatous herbs, 45–75 cm tall. Leaves 30–45×10–20 cm, oblong to oblong-lanceolate, glabrous. Flowers yellow, reddish-yellow or dark-red, in terminal spikes. Fruits 1.8–2 cm across, globose or nearly so, 3-angled, warty.

Ornamental.

FLS & FRS : Throughout the year.

AMARYLLIDACEAE 126

Key to genera

1. Filaments united by a petaloid membrane.. .. ..*Pancratium*
1. Filaments not united by a petaloid membrane.. ..*Crinum*

CRINUM L.

Key to species

1. Perianth erect, salver-shaped :
   2. Perianth lobes linear :
      3. Leaves 10–15 cm broad; umbels 15–20-flowered; perianth tube 7–10 cm long .. .. .. *C. asiaticum*
      3. Leaves 1.5–2 cm broad; umbels 6-12-flowered; perianth tube 5–7 cm long .. .. *C. defixum*
   2. Perianth lobes lanceolate : .. .. *C. pratense*
1. Perianth funnel-shaped :
   4. Perianth not nodding; stamens very long, declinate .... *C. latifolium*
   4. Perianth nodding; stamens very short, erect .. .. *C. brachynema*

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Crinum asiaticum L. Sp. Pl. 292. 1753; FBI 6:280; C 3:256; WI 2:367; Bailey 253; S 279.

Stout, perennial herbs, with large, tunicated bulbs. Leaves 30–75 cm long, linear-lanceolate, widely spreading, repand, glabrous. Flowers white, 15–20, sessile, in terminal umbels. Fruits ovoid, smooth, glabrous.

Ornamental.

FLS & FRS : Throughout the year.

Crinum brachynema Herb. Bot. Reg. Misc. 36. 1842; FBI 6:284; C 3:258.

Stout, perennial herbs. Leaves 30–60 × 7–10 cm, narrowly linear or lorate, glabrous, bright-to dark-green. Scape 30–60 cm long, dark-green, stout, subterete, glabrous. Flowers white, pedicellate, in terminal, umbellate cymes.

Dharampur (Inamdar, 1968).

FLS : Aug.

Crinum defixum Ker-Gawl. in Journ. Sci. & Arts. 3:105. 1817; FBI 6:281; C 3:257; WI 2:367; S & J 48.

Perennial herbs; bulbs 6-8 cm across, ovoid. Leaves 10–50 cm long, linear. Scapes stout, 30–50 cm long. Flowers white, in terminal umbels. Fruits 2-4.5 cm across, subglobose or ovoid.

In water-logged stony soil at Kutch, Saurashtra, Panchmahals and Dangs; rather rare.

FLS : Aug.-Oct. *FRS* : Oct.

Crinum latifolium L. Sp. Pl. 291. 1753; FBI 6:283; C 3:258; WI 2:368; S 279.

Perennial herbs, with underground, subglobose bulbs. Leaves 40–70 × 8–13 cm, linear-oblong or strap-shaped, subscabrous on margins. Flowers 10-20, in terminal umbels on long, stout scapes. Perianth tube 7–10 cm long, glabrous, lobes 7-10 × 1.8–2 cm, white with a purple streak in the centre from apex to base. Fruits not see

Chhotaudepur forest division; rare.

FLS : May–June

Crinum pratense Herb. Amaryllid. 256. 1837; FBI 6:282; C 3:257.

Scapigerous, perennial herbs, with ovoid bulbs. Leaves 40-65 × 1.8–2.5 cm, linear, glabrous, subacute at apex. Flowers white, 6–12, in terminal umbels, on long, stout scape. Capsule 2.5–4 cm across, subglobose.

Bulsar, Dangs, Vyara, Rajpipla, north Gujarat, in stony, moist or water-logged soil; gregarious and abundant in areas of occurrence.

FLS : Oct.-Dec. *FRS* : Nov.-Dec.

PANCRATIUM L.

Pancratium triflorum Roxb. Fl. Ind. 2:126. 1832; FBI 6:285; C 3:259; WI 7:216.

Perennial herbs, with globose bulbs. Leaves 15–35 × 1-1.5 cm, narrowly linear-lanceolate, glabrous. Flowers white, 3–8, in terminal umbels, on long scape. Perianth tube 3–4 cm long, lobes 1.5–2 cm long, linear. Fruits not seen.

Dangs (Ahwa, Malegaon), on hilly slopes; occasional.

FLS : May–July

HYPOXIDACEAE

Key to genera

1. Leaves linear-lanceolate or elliptic-lanceolate, plicate, petiolate; ovary and perianth bridged by a long, filiform tube; fruit indehiscent .. .. *Curculigo*

1. Leaves grass-like, not plicate, sessile; perianth sessile on ovary; fruit circumscissile or valvular dehiscent .. .. *Hypoxis*

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CURCULIGO Gaertn.

Curculigo orchioides Gaertn. Fruct. 1:63. t. 13. 1788; FBI 6:279; C 3:255; WI 2:400; S & J 48; S 274. *Curculigo brevifolia* Dryand. in Ait. Hort Kew (ed. 2) 2:253. 1811; Wt. Icon. t. 2043. f. 2. *Curculigo malabarica* Wt. Icon. 6:22. t. 2043. f. 1. 1853.

Perennial herbs, with underground root-stocks. Leaves 5-45×1-5 cm, radical, glabrescent. Flowers golden-yellow, 1-1.2 cm across, in small racemes. Capsule 1.2-1.6 cm long, beaked. Seeds subglobose, black, strongly rugose.

Throughout (except Kutch), in the deciduous forests. (KALI MUSLI)

FLS : June-Sep. *FRS* : Aug.-Sep.

HYPOXIS L.

Hypoxis aurea Lour. Fl. Cochinch. 200. 1790; FBI 6:277; C 3:254; WI 4:157. f. 100; S 278. *Curculigo graminifolia* Nimmo ex Graham, Cat. Pl. Bombay 215. 1839.

Perennial herbs with subglobose, fibrous root stocks. Leaves 9-30×0.8-1.2 cm, narrowly linear, subcoriaceous. Flowers 0.8-1 cm across, yellow, terminal, 1(-2) on 4-15 cm long scape. Capsule 0.6-0.8 cm long, oblong, 3-valved. Seeds black, tuberculate.

Dangs (Malegaon-Saputara), among grasses; locally common.

FLS & FRS : June-July

AGAVACEAE

Key to genera

1. Ovary inferior :
   2. Arborescent plants; leaves armed with hooked spines on margins :
      3. Scape central, exceeding the length of leaves; flowers or bulbils in panicles; stamens much longer than perianth lobes.. .. ..*Agave*

      3. Scape lateral, more or less equal to leaves; flowers or bulbils in racemes; stamens about equalling perianth lobes.. .. ..*Furcraea*
   2. Herbaceous plants; leaves unarmed.. .. ..*Polianthes*
1. Ovary superior :
   4. Foliage erect.. .. ..*Sansevieria*
   4. Foliage divergent to spreading.. .. .. ..*Yucca*

AGAVE L.

Some species are cultivated as ornamental or as a border plant by the forest department. A few of them are *A. americana* L., *A. ingens* Berg. and *A. wightii* Drum. & Prain.

FURCRAEA Vent.

Furcraea sp.

1.5-2 m tall shrubs. Leaves 90-150×10-15 cm, lanceolate, vivid-green, spinous-serrate in upper half of margins. Scapes 30-65 cm long. Flowers creamy-yellow, 3-3.5×2.2-2.5 cm, in bracteate racemes.

Dangs; planted in the compound of D. F. O.'s office.

Bulbils : Jan.

POLIANTHES L.

Polianthes tuberosa L. Sp. Pl. 316. 1753; C 3:260; Bailey 239; WI 8:184. f. 66.

Acaulescent, rigid herbs. Leaves 20-40×0.8-1.5 cm, narrowly linear, glabrous. Scape 60-75 cm tall, 20-25 cm long, upper part flower bearing. Flowers creamy-white or very pale-yellow 3.5-4×1-1.5 cm. Fruits not seen.

Ornamental; native of Mexico. (GULCHADI)

FLS : July-Nov.

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SANSEVIERIA Thunb. nom. cons.

Sansevieria thyrsiflora Thunb. Prodr. Pl. Cap. 65. 1939; Bailey 240.

A stout, tufted, perennial herb. Leaves 50–90×3–6 cm, linear-lanceolate or ensiform, thick, coriaceous, light-green variegated with dark-green transverse bands, margin yellow bordered, flat. Flowers 2–2.5 cm long, greenish-white, 2–3-fascicled, in 30–60 cm long, spike-like racemes. Berries dark-green, globose, glabrous.

Ornamental; native of West Africa.

FLS & FRS : Jan.–Feb. [Aug.-]

YUCCA L.

Yucca gloriosa L. Sp. Pl. 319. 1753; Bailey 241; C 3:283.

A stemless or shortly trunked shrub. Leaves 60–75×2–3.5 cm, in rosettes on ground, flat. Flowers greenish-white in panicles on central scape, drooping, bell-shaped. Fruits not seen.

Ornamental (Baroda, Vallabh Vidyanagar); an attractive plant when in full bloom.

FLS : July–Sep.

TACCACEAE

TACCA Forst.

Tacca leontopetaloides (L.) O. Ktze. Rev. Gen. Pl. 3:311. 1893. *Leontice leontopetaloides* L. Sp. Pl. 313. 1753. *Tacca pinnatifida* Forst. Char. Gen. 70. f. 35. 1776; FBI 6:287; C 3:262.

Perennial, erect herbs. Leaf solitary, 12–75 cm across, variously complicately lobed, lobes deep-green and bullate above, pale and prominently veined beneath. Flowers greenish-yellow, drooping, several, densely umbellate. Fruit 1.2–1.5 cm across, ovoid, 6-ribbed, yellow when ripe. Seeds pale-yellow, angular.

In the deciduous forests; occasional.

FLS : July–Oct. *FRS* : Aug.–Dec.

DIOSCOREACEAE

DIOSCOREA L.

Key to species

1. Leaves compound :
   2. Leaves 3-foliolate; male flowers in panicles of short, dense, cylindric spikes; stamens 6, all antheriferous.. .. ..*D. hispida*
   2. Leaves 5(-3 or -7)-foliolate; male flowers in long paniculate racemes; stamen 3, antheriferous, alternating with 3 staminodes.. .. ..*D. pentaphylla*
1. Leaves simple :
   3. Stem winged.. .. ..*D. alata*
   3. Stem not winged :
      4. Leaves alternate :
         5. Leaves 7-nerved from base.. .. .. ..*D. wallichii*
         5. Leaves 5-nerved from base.. .. .. ..*D. bulbifera*
      4. Leaves alternate and opposite :
         6. Leaves prominently veined beneath, sagittate-ovate or ovate-cordate.. .. ..*D. belophylla*
         6. Leaves not prominently veined beneath, elliptic-lanceolate or elliptic-obovate, rarely suborbicular .. ..*D. oppositifolia*

Dioscorea alata L. Sp. Pl. 1033. 1753; FBI 6:296; WI 3:69. f. 34–36. *Dioscorea alata* L. var. *globosa* Prain, Bengal Pl. 1065. 1903; C 3:267.

Perennial, extensive, glabrous twiners, with spirally twisted stem. Leaves 7.5–18.5×6.8–13 cm, 5-nerved from base, glabrous.

Cultivated in many parts, but best quality comes from Surat district. (RATALU)

FLS & FRS : Not seen.

Dioscorea belophylla Voigt, Hort. Sub. Calc. 653. 1845; WI 3:76; S 211. *Dioscorea glabra* Ilk. f. in Ilk. f. FBI 6:294. 1892 (p.p.). *Dioscorea nummularia* Lam. var. *belophylla* (Voigt) Prain Bengal Pl. 2:1067. 1903 & 2:802. 1961 (reprinted).

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Perennial, trailing or twining herbs. Leaves 5.5-15×3.2-9.5 cm, glabrous, sides of basal sinus straight. Capsules 2-4.5 cm across, suborbicular, slightly broader than long.

Chhotaudepur forest division–Kawant range (Thaker et al. 1970).

FLS : July

Dioscorea bulbifera L. Sp. Pl. 1033. 1753; C 3:265; WI 3:71. f. 37; Ch & O 223; S & J 48; S 281. *Dioscorea sativa* non L. 1753; Thunb. Fl. Jap. 151. 1784; FBI 6:295 (excl. *D. cliffortiana* Lam.).

An extensive, bulbil bearing twiner. Leaves 5–28×4.3–20.5 cm, glabrous, broadly ovate, membranous. Flowers greenish–white, in 15–22 cm long, axillary spikes. Capsules 1.8–2.3×0.7–1.2 cm, quadrately oblong. Seeds ovoid, membranous, winged only towards base.

Throughout, everywhere; common.

FLS : July–Oct. *FRS* : July–Mar.

Dioscorea hispida Dennst. Sch. Hort. Malab. 15. 1818; WI 3:73. f. 39; S & J 48. *Dioscorea daemona* Roxb. Hort. Beng. 72. 1814 (nomen) & Fl. Ind. 3:805. 1832; FBI 6:289; C 3:264. *Dioscorea triphylla* non L. 1753; Buch.-Ham. ex Wall. Cat. 5099 (nomen); Thaker J. I. Fl. Kutch 269. 1926.

An extensive, prickly twiner. Leaflets 8-22.5×7.5-17.2 cm, ovate-oblong or elliptic-oblong, persistently hairy and glandular beneath. Flowers greenish-yellow, males in dense, cylindric, pedunculate spike, female spike solitary, distant. Capsules 1.5-2.5 ×1-1.4 cm, oblong, winged; wings oblong, obtuse, membranous.

Dangs, Rajpipla, Chhotaudepur, Panchmahals, Saurashtra and Kutch; not common.

FLS : June-Sep. *FRS* : July-Jan.

Dioscorea oppositifolia L. Sp. Pl 1033 1753; FBI 6:292; C 3:266; WI 3:74. f. 40.

Slender twiners. Leaves 8–15×3–13 cm, glabrous, coriaceous, yellow cartilagineous along margins. Male flowers in dense, shortly pedunculate spikes upto 5 cm long; female spikes axillary, drooping, 10–15 cm long. Capsules 3.5-4.5 cm across, glabrous, broader than long. Seeds orbicular with a large, membranous wing all round nucleus.

Dangs, Vyara, Chhotaudepur, north Gujarat and Kutch; not common.

FLS : July-Sep. *FRS* : Oct.–Feb.

Dioscorea pentaphylla L. Sp. Pl. 1032. 1753; Roxb. Fl. Ind. 3:806 1832; Wt. Icon. t. 814. 1844; FBI 6:289; C 3:264; WI 3:75. f. 41; S & J 48; S 280. *Dioscorea triphylla* L. Sp. Pl. 1032. 1753.

Twiners, prickly towards base. Leaflets 5–16×3–7.7 cm, obovate–oblong, elliptic–oblong or elliptic–lanceolate, pubescent. Flowers white or greenish–white.

In deciduous and scrub forests; not frequent.

FLS : July–Sep.

Dioscorea wallichii Hk. f. in Hk. f. FBI 6:295. 1892; WI 3:76.

Twiners, prickly towards base. Leaves 6.5–18×4.5–19 cm, glabrous, dark-green and shining above, paler beneath. Male panicles 4.5–20 cm long, axillary or on leafless branches.

Dangs; rare.

FLS : Sep.–Nov.

LILIACEAE 131

Key to genera

1. Plants climbing by means of leaf–tips modified into tendrils .. .. *Gloriosa*
1. Plants not climbing; if climbing not tendril climbers :
   2. Leaves reduced to scales bearing needle–like or flattened ladodes in their axils .. .. *Asparagus*

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2. Leaves well developed; cladodes absent :

3. Leaves cauline; flowers deep-violet; grass-like plants .. .. *Iphigenia*

3. Leaves all radical, flowers white, creamy-white, pinkish, pinkish-purple, reddish-brown, reddish-yellow or orange; plants not grass-like :

4. Leaves appearing after the flowers; flowers reddish-brown .. .. *Urginea*

4. Leaves appearing with flowers :

5. Flowers in umbels .. .. .. *Allium*

5. Flowers in racemes :

6. Leaves fleshy, mucilagenous; flowers reddish-yellow or orange coloured .. .. *Aloe*

6. Leaves not fleshy; flowers white, creamy-white, pink or purple :

7. Underground stem large, ovoid or globose :

8. Flowers white or creamy-white; leaves linear; perianth 6-lobed; seeds flattened .. .. *Dipcadi*

8. Flowers pale- to bright pinkish purple; leaves oblanceolate or spathulate; perianth 6-partite .. *Scilla*

7. Underground stem absent or very small; root fibres tuberous or not :

9. Leaves semiterete; each cell of ovary 2-loculate; capsule triquetrous; plants often wholly annual .. .. .. *Asphodelus*

9. Leaves flat; each cell of ovary 4-or more ovulate; capsule 3-winged .. .. *Chlorophytum*

ALLIUM L.

Key to species

1. Leaves cylindric, fistular; umbels dense .. .. .. *A. cepa*

1. Leaves flat, linear; umbels lax .. .. *A. sativum*

Allium cepa L. Sp. Pl. 300. 1753; FBI 6:337; C 3:284; WI 1:56; Bailey 246; S & J 48.

Scapigerous herbs; bulbs 1.5–8 cm across. Leaves 15–45 cm long. Scape 30–60 cm long. Flowers white. Fruits not seen.

Cultivated as a cold season crop. (DONGRI, KANDO, PYAZ)

FLS : Feb.–Apr.

Allium sativum L. Sp. Pl. 296. 1753; FBI 6:337; C 3:284; WI 1:58; Bailey 247.

Perennials, 30–45 cm tall; bulbs 2–4 cm broad; bulblets or cloves 0.8–1.5 × 0.4–1 cm, fleshy, creamy-yellow, ovoid, acuminate, several in a white tunic. Leaves 15–30 cm long. Flowers white, in 6–8.5 cm broad umbels.

Cultivated as a winter crop. (LASAN)

FLS : Dec.–Feb.

ALOE L.

Aloe barbadensis Mill. Gard. Dict. no. 2. 1768; Bailey 209; S & J 48. *Aloe perfoliata* L. var. *vera* Tourn. ex L. Sp. Pl. 320 1753. *Aloe vera* (L.) Webb. & Berth., non Mill. 1768; C 3:283; WI 1:61. Pl. 11(3).

Acaulescent shrubs. Leaves 10–23 × 3–6.5 cm, in rosettes, lanceolate or ensiform, spinous-toothed on margins. Flowers 1.5–2 cm long, in 20–45 cm long racemes, in upper part of 30–75 cm long scape. Fruits 1.5–2 × 0.6–0.8 cm, trigonous-oblong, loculicidally 3-valved. Seeds trigonous, winged.

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Throughout in waste places, scattered or subgregarious; also cultivated near houses. (KUNVARPATO)

FLS : Dec.–Apr. *FRS :* Jan.–May

ASPARAGUS L.

Key to species

1. Plants unarmed; cladodes on short branches, lateral branches spreading, together with cladodes, resembling a peacock's feather... .. ..*A. plumosus*
1. Plants armed; cladodes and branches not as above :
   2. Flowers in axillary clusters.. .. ..*A. dumosus*
   2. Flowers racemose :
      3. Cladodes subulate or triquetrous .. .. *A. racemosus* var. *javanicus*
      3. Cladodes flat, linear :
         4. Cladodes almost straight .. .. .. *A. sprengeri*
         4. Cladodes falcate .. .. *A. gonoclados*

Asparagus dumosus Baker in Journ. Linn. Soc. 14:608. 1874; FBI 6:315 ; C 3:269.

A subscandent undershrub. Cladodes 3–6–nate, 0.3–0.6 cm long, spinous–tipped, light–olivaceous–green. Flowers white, axillary, solitary or twin. Fruits not seen.

Kutch and Rajpipla; rare.

FLS : May–June

Asparagus gonoclados Baker in Journ. Linn. Soc. 14 : 627. 1874; *FBI* 6:318; C 3:271; WI 1:131; S & J 48.

Subscandent shrub, with greyish–brown bark ; cladodes 3–6 cm long, 2–6, commonly 3–nate, subulate, spinous–tipped. Flowers white.

Saurashtra, north Gujarat, Panchmahals and Rajpipla; rare to occasional. (SATAVRI)

FLS & FRS : Nov.–Jan.

Asparagus plumosus Baker in Journ. Linn. Soc. 14 : 613. 1874 & Fl. Trop. Afr. 7 :430. 1898; WI 1:131; Bailey 216.

Ornamental.

FLS & FRS : Not seen.

Asparagus racemosus Willd. var. **javanicus** (Kunth) Baker in Journ. Linn. Soc. 14:624. 1875; FBI 6:316; C 3:270; S & J 48; S 282. *Asparagopsis javanica* Kunth, Enum. 5:100. 1850.

Deciduous, sarmentose shrubs, with pale–to dark–brown to ashy–brown bark. Cladodes 1.2–2 cm long, glabrous. Flowers white, in 3–8 cm long racemes. Berries 0.4–0.6 cm across, nearly globose, scarlet or pale–purple.

Throughout, cultivated or wild in forest undergrowth and hedges. (SATAVRI)

FLS : Sep.–Nov. *FRS :* Oct.–Dec.

Asparagus sprengeri Regel. in Act. Hort. Petrop. 11:302. 1890 & in Gartenfl. 49. f. 80. 1890; Bailey 216.

Undershrubs, with drooping or rambling branches. Cladodes 2–3.5 cm long. Flowers white, in 2.5–4 cm long racemes.

Ornamental.

FLS : Oct.–Nov.

ASPHODELUS L.

Asphodelus tenuifolius Cav. in Ann. Cienc. Nat. 3:46. t. 27. f. 2. 1801; FBI 6:332; C 3:279; S & J 48.

Annual, slender herbs, 20–50 cm tall. Leaves 6–16 cm long, glaucous–green. Flowers light–purple, fading white, in lax racemes. Capsules 0.2–0.3 cm across, glabrous, globose, 3–valved. Seeds 6, two in each loculus, obovoid, rounded and rugose on back.

Throughout, a weed in waste places and cultivated fields; common (DUNGRO)

FLS & FRS : Dec.–Mar.

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CHLOROPHYTUM Ker.

Key to species

1. Plants with tubers; scapes up to 30 cm long :
   2. Tubers attached at ends of fibrous roots.. ..*C. tuberosum*
   2. Tubers sessile.. .. ..*C. borivilianum*
1. Plants without root tubers; scapes up to 10 cm long.. .. ..*C. malabaricum*

Chlorophytum borivilianum Sant. & Fernand. in Journ. Bombay nat. Hist. Soc. 52:896–900. t. 1. 1955; Shah & Suryanarayana *ibid.* 63(3): 778. 1967.

20–30 cm tall herbs. Leaves 12–22×1–1.8 cm, lorate or ensiform, flat or folded lengthwise. Flowers 2.2–2.5 cm across, white, in 3-nate clusters, in racemes in upper half of central scape. Capsule 0.6–0.8 cm across, obovoid, trigonous.

Dangs, among grasses; occasional.

FLS & FRS : June–Aug.

Chlorophytum tuberosum (Roxb.) Baker in Journ. Linn. Soc. 15: 332. 1875; FBI 6:334; C 3:281; Ch & O 225; S & J 48; S 283. *Anthericum tuberosum* Roxb. Fl. Ind. 2:149. 1824.

Scapigerous herbs, with 2–3.5×0.3–0.5 cm, ellipsoid-oblong tubers. Leaves 10–30×1–1.7 cm, linear, glabrous. Flowers white, in 6–16.5 cm long racemes on a central scape. Capsules 0.8–1 cm long, obovoid, trigonous, 3-valved. Seeds minute, black.

Throughout, among grasses in stony ground.

FLS & FRS : June–Oct.

Chlorophytum malabaricum Baker in Journ. Linn. Soc. 15:331. 1875; FBI 6:335. *Phalangium tuberosum* Dalz. & Gibs. Bombay Fl. 251. 1861 (non Kunth).

Scapigerous herbs. Leaves 5–12×0.6–1 cm, linear–ensiform or lorate, falcate, conduplicate. Flowers 2–2.5 cm across, white, in racemes, in the upper half of 7–10 cm long scape.

Dangs, among grasses in stony or gravelly soil; rare.

FLS : June.

DIPCADI Medic.

Dipcadi montanum (Dalz.) Baker in Journ. Linn. Soc. 11:398. 1871; FBI 6:346; C 3:278; Ch & O 225. *Uropetalum montanum* Dalz. in Kew Journ. Bot. 2:142. 1850.

Perennials, with globose, tunicated bulbs, 2–2.5 cm across. Leaves 8–25 cm long. Flowers 6–10, in lax racemes, on a scape as long as, or longer than leaves.

Pavagadh, in rocky grounds; abundant but rare.

FLS : July–Aug.

Dipcadi sp.

Bulbs tunicate, ovoid, 2.5×2 cm. Leaves 15–25×0.3–0.4 cm, glabrous. Scapes 15–18 cm long, erect. Racemes 4–6 cm long, few-flowered. Perianth 1–1.2 cm long, campanulate. Capsule 0.8–1.2 cm long, broadly ovate or orbicular. Seeds many, 0.4–0.6×0.2–0.4 cm, orbicular, smooth, black.

Kutch (Bhuj) from sandy–alluvial soil.

Similar to *D. montanum* Baker in general appearance but it differs from the latter in having sessile ovary. The description of our plant fits more with *D. erythraeum* Webb. & Berth. which incidentally is recorded from Sind (Jemadar Ka Landa, Karachi) by Cooke.

FLS & FRS : Aug.

GLORIOSA L.

Gloriosa superba L. Sp. Pl. 305. 1753; FBI 6:358; C 3:274; Bailey 214; WI 4:139. t. 8 (col.); Ch & O 224; S & J 49.

Perennial herbs. Leaves 5–12.5×1.5–3 cm, alternate, opposite or whorled, ovate-lanceolate, glabrous. Flowers large,

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axillary, solitary, scarlet to crimson in upper part, yellow in lower half, at length completely scarlet. Capsules 2-3 cm long.

Throughout; common on hedges; rare in forest undergrowth.

FLS : July-Sep. *FRS :* Aug.-Oct.

IPHIGENIA Kunth

Iphigenia indica (L.) A. Gray in Kunth, Enum. 4:213. 1843; FBI 6:357; C 3:275; S 283. *Melanthium indicum* L. Mant. 2:226. 1771.

Herbs, 15–35 cm tall, with 0.7–1.2 cm broad, globose tubers. Leaves 8–15×0.3–0.6 cm, narrowly linear. Flowers 1–1.5 cm across, star-like, solitary, axillary and terminal. Capsule 1.5–2× 0.5–0.7 cm, oblong-ellipsoid, glabrous. Seeds 0.1-0.15 cm across, spherical, brown.

Dangs, Chhotaudepur and Pavagadh, among grasses rather rare.

FLS & FRS : July-Aug.

SCILLA L.

Scilla hyacinthina (Roth) Macbr. in Contrib. Gray Herb. (n.s.) 56:14. 1918. *Ledebouria hyacinthina* Roth, Nov. Pl. Sp. 195. 1821. *Scilla indica* Baker in Saund. Refug. Bot. 3:App. 12. 1870; FBI 6:348; C 3:276 (non Roxb. 1832).

Perennial herbs, 8–15 cm tall; bulbs 2-3×1.2-2 cm, ovoid, tunicated. Leaves 2-4, radical, 3.5-7.5×1-2.5 cm, oblanceolate or spathulate, glabrous. Flowers pale- to bright-pinkish-purple, in 6-15 cm long racemes. Capsules 0.4–0.5 cm across, violet-purple, globose or ovoid.

Dangs, among grasses; common.

FLS & FRS : June-July

URGINEA Stein.

Urginea indica (Roxb.) Kunth, Enum. 4:333. 1843; FBI 6:347; C 3:277; S & J 49; S 253. *Scilla indica* Roxb. Fl. Ind. 2:147. 1832.

Perennial herbs; bulbs 2-3.7×1.2-5 cm, ovoid, tunicated. Leaves 2–4, 3.5-30×1.2-4 cm, flat, strap-shaped. Flowers when plants leafless, few, in racemes, in upper part of 75–100 cm tall scape. Capsules 1.5–2 cm long, ellipsoidal.

Bulsar, Dangs, Rajpipla, Chhotaudepur, Saurashtra; not common. (JANGLI DUNGLI, JANGLI PYAZ)

FLS : Feb.-Apr. *FRS :* Apr.-May

SMILACACEAE

SMILAX L.

Smilax zeylanica L. Sp. Pl. 1029. 1753; FBI 6:309. *Smilax macrophylla* Roxb. Hort. Beng. 72. 1814 (nomen) & Fl. Ind. 3:793. 1832; FBI 6:310; Cl. in DC. Mon. Phan. 1:193. 1878; C 3:271 (non Willd. 1806). *Smilax ovalifolia* Roxb. Fl. Ind. 3:794. 1832.

Extensive, deciduous, woody, prickly climbers. Leaves 5.5-22 cm long and as much broad, glabrous, petiolate, ovate, oblong, elliptic or elliptic-oblong or nearly orbicular, cordate, rounded or subacute at base. Flowers dioecious, numerous, greenish, in axillary, pedunculate umbels. Berries globose, smooth, glabrous.

At times cultivated in gardens. (SARSAPARILA)

FLS : Sept.-Oct. *FRS :* Nov.-Mar.

PONTEDERIACEAE

Key to genera

1. Plants not floating; petiole not swollen; flowers distinctly pedicelled; perianth actinomorphic; stamens 6, one much longer than other; filaments glabrous.. .. *Monochoria*
1. Plants floating; petiole swollen; flowers sessile; perianth zygomorphic; stamens 6, much longer than others; filaments at least those of longer stamens hairy.. .. .. *Eichhornia*

EICHHORNIA Kunth nom. cons.

Eichhornia crassipes (Mart.) Solms. in DC. Mon. Phan. 4:527. 1883; WI 3:130. ff. 80–81. *Pontederia crassipes* Mart. Nov. Gen. & Sp. Pl. 1:9. t. 4. 1823.

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Stoloniferous, floating herbs. Leaves radical, 7–25 cm long, broadly ovate to rhomboid, firmly herbaceous. Flowers mauve or lilac, in 15–25 cm long spikes.

In the temporary ponds and ditches in south and central Gujarat; locally abundant; native of Brazil. (KANPHUTTI)

FLS : Oct.–Nov.

MONOCHORIA Presl

Monochoria vaginalis (Burm. f.) Presl, Rel. 1:128. 1827 ex Kunth, Enum. 4:134. 1843; FBI 6:363; C 3:286; WI 6:421. *Pontederia vaginalis* Burm. f. Fl. Ind. 80. 1768.

12–30 cm tall herbs, with short stocks. Leaf solitary at top of stem, 5.5–13.5×2.2–5.5 cm, ovate to ovate–lanceolate. Flowers in axillary, condensed racemes. Fruits 0.8–1 cm long, ellipsoid glandular–pubescent.

Throughout (except Kutch and Saurashtra), in moist places.

FLS & FRS : Aug.–Oct.

COMMELINACEAE

Key to genera

1. Perfect stamens 6 :
   2. Inflorescence sessile, embedded in the hollow axil of sheath .. .. *Amischophacelus*
   2. Inflorescence not as above.. .. .. .. *Cyanotis*
1. Perfect stamens 3 with 1–3 staminodes :
   3. Flowers regular, not enclosed in a spathaceous bract.. .. .. *Murdannia*
   3. Flowers irregular enclosed in a spathaceous bract.. .. .. *Commelina*

AMISCHOPHACELUS Rolla Rao & Kammathy

Key to species

1. Filaments naked: capsule 3–horned at apex; seeds subquadrate, smooth or obscurely pitted.. .. .. *A. cucullata*
1. Filaments densely bearded; capsule beaked; seeds cylindric, pitted.. .. .. *A. axillaris*

Amischophacelus axillaris (L.) Rolla Rao & Kammathy in Journ Linn. Soc. 59(379): 306. 1966. *Tradescantia axillaris* L. Mant. 2:321. 1771. *Cyanotis axillaris* (L.) Schult. f. Syst. 7:1154. 1830; FBI 6:388; C 3:305; WI 2:409; S & J 49.

Annuals, 30–60 cm tall, diffuse or suberect, rooting at lower nodes. Leaves 4–13×0.5–1 cm, linear–lanceolate, glabrous. Flowers blue, purple, or white, axillary, solitary. Capsules 0.5–0.6 cm long, oblong, apiculate, glabrous.

South Gujarat and Saurashtra; rather rare, in moist places.

FLS & FRS : Aug.–Jan.

Amischophacelus cucullata (Roth) Rolla Rao & Kammathy in Journ. Linn. Soc. 59(379): 306. 1966. *Tradescantia cucullata* Roth, Nov. Pl. Sp. 189. 1821. *Cyanotis cucullata* (Roth) Kunth, Enum. Pl. 4:107. 1843; FBI 6:389.

Prostrate or suberect herbs, rooting at nodes. Leaves 1.5–4.5×0.3–0.5 cm, spreading or reflexed, linear–lanceolate, glabrous. Flowers bright–violet, in axillary fascicles. Capsules 0.4–0.5 cm long, pale–straw–coloured, glabrous, ellipsoid–oblong. Seeds minute, subquadrate, lead–coloured.

South Gujarat (Dahej, Broach, Rajpipla), central Gujarat (Chhotaudepur) and Saurashtra, a weed in cultivated fields; not common.

FLS & FRS : Aug.–Jan.

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COMMELINA L.

Key to species

1. Capsule 3–celled, 3–seeded :
2. Capsule 3-celled, 3–valved; seeds free in the cells :
3. Spathes 3-8, crowded at tip of branches, without any smaller leaves in addition to two mature leaves subtending spathes; spathes sessile or nearly so .. .. *C. paludosa*
3. Spathes 3–5, confined at tips of branches, accompanied by 2-4 smaller leaves in addition to mature leaves subtending spathes; spathe on 0.5 cm long peduncle.. .. .. *C. erecta*
2. Capsule 3–celled, 2–valved; seeds adnate to the cell .. .. *C. albescens*
1. Capsule 2–celled, 2–seeded.. .. .. .. *C. suffruticosa*
1. Capsule 3–celled, 5–seeded :
4. Leaves ovate–lanceolate, ovate–oblong or linear to linear–oblong; capsule apiculate; spathes distinctly pedunculate, complicate or cucullate, ovate–lanceolate; seeds smooth or tuberculate :
5. Seeds tuberculate.. .. .. *C. diffusa*
5. Seeds smooth :
6. Leaves usually with straight margins; seeds truncate at one end.. .. .. *C. hasskarlii*
6. Leaves usually with wavy margins; seeds not as above.. .. .. *C. forskalaei*
4. Leaves elliptic–ovate or elliptic–oblong; capsule emarginate; spathes sessile or subsessile, turbinate; seeds pitted.. .. .. *C. benghalensis*

Commelina albescens Hassk. in Schweinf. Beitr. Fl. Aethiop. 210. 1867; FBI 6:373; C 3:294; S & J 49.

The inclusion of this species is on the authority of Santapau & Janardhanan (1967) who listed if from Saurashtra. The authors, however seem doubtful of its occurrence as the specific epithet is followed by a question mark in the parenthesis.

Commelina benghalensis L. Sp. Pl. 41. 1753; FBI 6:370; C 3:291; Wl 2:313; Ch & O 226; S & J 49.

Diffuse or suberect, glabrescent herbs. Leaves 2–8.5 × 1–4.7 cm, glabrous or thinly pubescent. Flowers bright–blue, in short cymes, in axillary, solitary, turbinate spathe. Capsule 0.4–0.5 cm long, pyriform. Seeds oblong, ±0.1 cm long, truncate or rounded at ends.

Throughout, everywhere; common.

FLS & FRS : Aug.–Jan.

Commelina diffusa Burm. f. Fl. Ind. 18. t. 7. f. 2. 1768; S & J 49; S 284. *Commelina nudiflora* auct. plur. non L.; FBI 6:369; C 3:290; WI 2:313.

Annuals, 30–60 cm tali, creeping, rooting at nodes. Leaves 2.5–9.5 × 0.5–2.5 cm, glabrous. Flowers 1–3 in a spathe, blue or white. Capsule 0.2–0.4 cm long, oblong.

Throughout in plains in moist ground; common.

FLS & FRS : Aug.–Oct.

Commelina erecta L. Sp. Pl. 41. 1753; Morton in Journ. Linn. Soc. Bot. London 60(382):183. 1967. *Commelina kurzii* Cl. in Journ. Linn. Soc. (Bot.) 11:444. 1871 & Comm. & Cyrt. Beng. t. 8. 1874; FBI 6:373. *Commelina undulata* R. Br. Prodr. 270. 1810; S 285.

Annual, dichotomously branched herbs, erect or suberect, 30-45 cm tall, at times rooting at lower nodes. Leaves 6.5–14 × 0.8-2.3 cm, ovate-lanceolate, pubescent beneath. Spathes 1.8–2.5 cm broad, glabrous. Flowers violet. Capsules glabrous, ellipsoid, apiculate. Seeds 0.3–0.35 cm long, oblong, blackish–brown.

South to north Gujarat in forest undergrowth; occasional.

FLS & FRS : July–Nov.

Commelina forskalaei Vahl, Enum. 2:172. 1806; FBI 6:371; C 3:292.

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Prostrate or s ⊐ berect herbs, rooting at lower nodes. Leaves 6.5–7.6 × 0.9–1.3 cm, linear to linear–oblong, sparsely hairy, pedunculate. Flowers blue. Capsule 0.3–0.5 cm long, oblong laterally compressed, ribbed. Seeds 0.15–0.25 cm long, brown, glabrous.

Throughout in moist ground.

FLS & FRS : July–Nov.

Commelina hasskarlii Cl. Comm. & Cyrt. Beng. 13. t. 3. 1874 & in DC. Mon. Phan. 3:157. 1881; FBI 6:370; C 3:291; S & J 49.

Creeping or ascending, dichotomously branched. glabrous herbs. Leaves 3.8–8.2 × 1–2 cm, ovate–oblong or ovate–lanceolate, glabrous. Spathes 2–2.5 × 1.5–2 cm, ovate–lanceolate, glabrous, pedunculate. Flowers biue. Capsule 0.3–0.4 cm long, glabrous. Seeds brown, smooth.

Throughout (except Kutch) in moist ground; occasional.

FLS & FRS : Aug.–Oct.

Commlina paludosa Bl. Enum. Pl. Java 1:2. 1827; Rolla Rao & Kammathy in Journ. Bombay nat. Hist. Soc. 59(1):60. Pl. 1(B). 1962; Ch & O 226; S 285. *Commelina obliqua* Buch.-Ham. ex Don, Prodr. Fl. Nep. 45. 1825; FBI 6:372; C 2:293; WI 2:313 (non Vahl, 1806).

Erect or diffuse, slender, 30–50 cm tall herbs. Leaves 4–13.7 × 1.6–3.2 cm, ovate–lanceolate, glabrous. Spathe 1.5–1.8 cm across. Flowers blue.

South to north Gujarat in forest undergrowth and hedges; occasional.

FLS & FRS : Aug.–Oct.

Commelina suffruticosa Bl. Enum. Pl. Java 1:3. 1827; Rolla Rao & Kammathy in Journ. Bombay nat. Hist. Soc. 59(1):65. f. 3. & map 4. 1962; S & J 49.

30–90 cm tall, glabrous herbs, rooting at basal nodes. Leaves 6.5–16.5 × 2.2–6.5 cm, ovate–lanceolate, glabrous or hairy. Spathes 1.5–3 × 1.4–2.4 cm, pubescent, terminal, pedunculate. Capsule quadrate–oblong. Seeds smooth, dull–black.

Dangs, in forest undergrowth; frequent.

FLS & FRS : July–Oct.

CYANOTIS D. Don

Key to species

1. Floccosely woolly herbs; cymes not scorpioid....*C. fasciculata*

1. Herbs glabrous, but for stem ciliate on one side; cymes scorpioid.. .. ..*C. cristata*

Cyanotis fasciculata (Heyne ex Roth) Schult. f. Syst. 7:1150. 1830; FBI 6:387; C 3:303; S & J 49; S 287. *Tradescantia fasciculata* Heyne ex Roth, Nov. Pl. Sp. 189. 1821.

6–20 cm tall annuals, reddish–purple with age. Leaves 1.5–9 × 0.2–2.2 cm, lanceolate to ovate–lanceolate, subfleshy, hairy. Flowers pink to bright–purple, in compact, axillary and terminal cymes. Capsule 0.2–0.4 cm long, oblong.

Saurashtra, Chhotaudepur, Dangs, Bulsar; not common.

FLS & FRS : Aug.–Sep.

Cyanotis cristata (L.) Schult. f. Syst. 7:1150. 1830; FBI 6:385; C 3:304; WI 2:409; S & J 49; S 248. *Commelina cristata* L. Sp. Pl. 42. 1753.

Diffuse or suberect annuals. Leaves 1.5–8 × 0.5–2 cm, ovate–oblong, elliptic–oblong or ovate–lanceolate, glabrous. Flowers violet–purple. Spathes 1.2–2 × 0.8–1.8 cm, glabrous, closely imbricating. Capsule 0.2–0.3 cm long, trigonous.

Throughout (except Kutch), in shaded spots; common.

FLS & FRS : July–Dec.

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MURDANNIA Royle

Key to species

1. Plants dark-green to deep-purple, grass like; leaves linear, 2.5-11×0.2-0.3 cm.. .. ..*M.. semiteres*

1. Plants bright-green, not grass-like; leaves broadly oblong-linear, ovate-lanceolate or ovate-oblong 1.5-5×0.5-1.2 cm .. ..*M. nudiflora*

Murdannia nudiflora (L.) Brenan in Kew Bull. 189. 1952; Rolla Rao in Bull. Bot. Surv. India 4:393. 1961. *Commelina nudiflora* L Sp. Pl. 41. 1753 (p. p.) vide Merrill in Journ. Arn. Arb. 18:64-66. 1937. *Tradescantia malabarica* L. Sp. Pl. (ed. 2) 412. 1762. *Aneilema nudiflorum* R. Br. Prodr. 271. 1810 (in adnot.); FBI 6:378; C 3:298. *Murdannia malabarica* (L.) Brueck. in Pfam. (ed. 2) 15 A : 173. 1930; S 286.

10-30 cm tall, annual, suberect or diffuse herbs. Leaves glabrous. Flowers violet-purple or pale-purple, in terminal and axillary panicles. Capsule 0.3-0.4 cm long globose, mucronate. Seeds 2-3 in each cell, rugose, tuberculate, reddish-to dark-brown.

Throughout among grasses in damp place.

FLS & FRS : Aug.-Oct.

Murdannia semiteres (Dalz.) Santapau in Poona Agri. Coll. Mag. 41:284. 1951. *Aneilema semiteres* Dalz. in Kew Journ. Bot. 3:138. 1851. *Aneilema paniculatum* Wall. Cat. no. 5216. 1828 (nomen) ex Cl. in DC. Mon. Phan. 3:215. 1881; FBI 6:381; C 3:300.

Erect, caespitose herbs, 8-25 cm tall. Leaves glabrous. Flowers deep-violet or bluish-purple, in terminal, paniculate cymes. Capsules 0.2-0.3 cm across, globose, glabrous.

South Gujarat, in deciduous forests among grasses in stony ground; common.

FLS & FRS : Sep.-Oct.

JUNCACEAE

JUNCUS L.

Key to species

1. Rigid herbs; leaves solid; inflorescence compact ..*J. maritimus*

1. Slender herbs; leaves not solid; inflorescence lax..*J. bufonius*

Juncus bufonius L. Sp. Pl. 328. 1753; Shah in Journ. Bombay nat. Hist. Soc. 67:608. ff. 1-4. 1970.

Tufted annuals, upto 20 cm tall. Leaves very narrowly linear. Flowers few, in cymes, ultimately forming lax panicles. Capsule enclosed in persistent tepals.

North Gujarat (from saline river beds of Sabarmati near Sadra to Sarkhej)

FLS & FRS : Feb.-Mar.

Juncus maritimus Lam. Encycl. Meth. 3:264. 1789; FBI 6:393; C 3:308; Jain in Bull. bot. Surv. India 2:307-308. f. 1. 1960; S & J 51.

Densely caespitose, erect, perennials, 60-150 cm tall. Leaves few, solid. Flowers in decompound cymes, unequally pedunculate. Capsule 0.5-0.6 cm long, ovoid or conical, trigonous. Seeds oblong or obovoid, caudate at either end.

Kutch (Mundra-Mandvi, Rudramata, Gandhidham)

FLS & FRS : Oct.-Feb.

ARECACEAE (PALMAE)

Key to genera

1. Plants armed, woody climbers .. ..*Calamus*

1. Plants unarmed, trees or shrubs :

2. Leaves palmate, simple :

3. Trunk dichotomously branched .. .. ..*Hyphaene*

3. Trunk unbranched .. .. *Borassus*

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2. Leaves pinnately compound; bark brown to sandy-brown, greyish-black or grey-ash coloured :
   4. Leaves bipinnate; leaflets truncately irregularly toothed at apex; inflorescence much branched spadix, branches drooping .. .. *Caryota*
   4. Leaves simply pinnate; leaflet apex and inflorescence not as above :
      5. Trunk covered with persistent leaf-bases .. *Phoenix*
      5. Trunk not as above :
         6. Trunk smooth; bark grey-ash coloured in lower half, green in upper part.. .. ..*Roystonea*
         6. Trunk with annular marks, covered atleast in basal parts with fibrous sheaths; bark throughout pale- to sandy-brown .. .. .. *Cocos*

BORASSUS L.

Borassus flabellifer L. Sp. Pl. 1187. 1753; FBI 6:482; C 3:321; WI 1:203. Pl. 32; Bor 347; S & J 49; S 289.

Trees, 10–16 m tall, with straight trunk; bark with annular scars. Leaves in a terminal crown, 60–100 cm or more across, plicate, fan-shaped, coriaceous. Male spadix cylindric, much branched, female simple; male flowers minute, creamy-white.

Throughout in plains. [TAD]

FLS : Mar.–Apr. *FRS :* Apr.–May

CALAMUS L.

Calamus rotang L. Sp. Pl. 325. 1753; FBI 6:447; C 3:318; WI 2:12. t. 9.

An extensive liana. Leaflets 7–21×0.6–1 cm, sessile, subopposite, alternate, linear-lanceolate. Flowers creamy-yellow, in 8–15 cm long, pendulous racemes.

North Gujarat (Ahmedabad, Pahada); at Pahada only one plant seen in a wild state. (NETAR)

FLS : Aug.

LIBRARY BSI

CARYOTA L.

Caryota urens L. Sp. Pl. 1189. 1753; FBI 6:422; C 3:315; WI 2:90, f. 42; Bor 348; S & J 49.

5–10 m tall trees; trunk straight, transversely annulated. Leaves 1–1.5 m long, in terminal crown; leaflets 8–17.5×6–8 cm, glabrous, broadly obovate, irregularly truncate at apex. Flowers monoecious, in 1–2 m long, compound spadix with drooping branches.

Ornamental. (SHIVJATA)

FLS : All round the year.

COCOS L.

Cocos nucifera L. Sp. Pl. 1188. 1753; FBI 6:482; C 3:322; WI 2:262. ff. 91 & 94 & Pl. 13; Bor 350; S & J 49.

Trees, 8–15 m tall with straight or slightly bent trunk, basal part covered with massive rootlets. Leaves 1.5–5 m long, pinnate; leaflets 30–45 cm long, coriaceous, linear-lanceolate, equidistant. Spadix 1–2 m long, androgynous, at length drooping. Drupes fibrous, 3-gonous, obovoid or subglobose.

Planted at some places. (NARIEL, TARAFOO)

FLS & FRS : Most part of the year

HYPHAENE Gaertn.

Hyphaene indica Becc. in Agric. Colon. 2:173. 1908; Blatter in Palms Brit. India & Ceylon 157. Pl. 33–34 & f. 24. 1926; Rao in Journ. Bombay nat. Hist. Soc. 60:761–764. 1963.

8–10 m tall trees, with straight, dark-black, annulated trunk, sometimes trunk covered with persistent leaf bases. Leaves flabellate, multifid, about 1 m broad, long petiolate.

A typical species, in Saurashtra, Ahmedabad, Baroda and Ubharat. (RAVAN TAD, DIV TAD) (ε/a)

FLS & FRS : Not noted

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PHOENIX L.

Key to species

1. Trunk often surrounded by a dense mass of root suckers at base .. .. *P. dactylifera*

1. Trunk without root suckers .. .. .. *P. sylvestris*

Phoenix dactylifera L. Sp. Pl 1188. 1753; FBI 6:424; Blatter, Palms Brit. India & Ceylon 25. t. 8. 1926; Bor 345; WI 8:18–24. ff. 11 & 12.

8–10 m tall trees, with sandy-brown; erect or somewhat bent trunk. Leaves in the form of terminal crown; pinnae 20–40 cm long, often approximate. Male panicles white, compact, 15–25 cm long.

Listed by Blatter (1910) from Kutch.

Phoenix sylvestris (L.) Roxb. Hort. Beng. 73. 1814 (nomen) & Fl. Ind. 3:787. 1832; FBI 6:425; C 3:311; Bor 349; WI 8:25. ff 13 14 & Pl. 2(col.); S & J 49. *Elate sylvestris* L. Sp. Pl. 1189. 1753.

8–15 m tall trees; trunk straight or crooked. Leaves 1.8–3 m long; leaflets 20–30 × 1–1.4 cm, linear-lanceolate, conduplicate, coriaceous, glabrous. Flowers sessile, minute, spicate on primary branches of compound spadix. Ripe berries 2.5–3 × 1.5–2 cm, ellipsoid-oblong, orange-coloured.

Throughout, in waste places. (KHAJURI)

FLS : Jan.–Mar. *FRS :* Mar.–June

ROYSTONEA O. F. Cook

Roystonea regia (H. B. & K.) O. F. Cook in Bull. Torr. Bot. Cl. 531. 1901; Bor 342; Bailey 173; S & J 49; WI 9:82. *Oreodoxa regia* H B. & K. Nov. Gen. Pl. 1:305. 1815; C 3:321.

6–8 m tall trees; trunk straight, smooth more or less swollen in middle. Leaves 1.5–2.5 m long, pinnate, in terminal crown; leaflets 20–40 cm long, linear-ensiform, glabrous. Flowers not seen.

Planted as an ornamental in gardens and roads.

FLS & FRS : Not seen.

PANDANACEAE

PANDANUS L. f. nom. cons.

Panadanus odoratissimus L. f. Suppl. 424. 1781; St. John in Taxon 12(5):201–204. 1963; WI 7:218. ff. 92 & 93. *Pandanus tectorius* Soland. ex Parkinson in Journ. Voy. H. M. S. Endeavour 46. 1773 ex Warburg in Pfreich. 3:46. 1900; C 3:324. *Pandanus fascicularis* Lam Encycl. 1:372. 1783; FBI 6:485; S & J 49.

Large shrubs or small trees. Leaves 60–100 × 4.5–8 cm, linear-ensiform, spiny on margins and mid-rib. Flowers dioecious; spadix of male flowers much-branched, of numerous, sessile, cylindric spike; spadix of female flowers simple, sessile.

Planted; seldom wild in north Gujarat (Pahada). (KEVRO VEKDO).

FLS : July–Oct.

TYPHACEAE

TYPHA L.

Key to species

1. Leaves semicylindric above the sheath; pollen grains simple .. .. *T. angustata*

1. Leaves trigonous above the sheath; pollen grains 4-globate .. .. *T. elephantina*

Typha angustata Bory & Chaub. Exp. Sci. Mor. 2(1):338. 1832; FBI 6:489; C 3:326; S & J 50.

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Robust, perennial, scapigerous herbs, 1–2 m tall. Leaves as long as scape, vertical, sheathing at base. Spikes 40–45 cm long, terminal, terete, reddish–brown; male flowers above, female beow, separated by a constricted sterile region. Nutlets minute, ellipsoid or ovoid, brown.

Common, in scattered, compact patches, in marshy grounds along water courses. (GHABAJARIU, RAMBAN)

FLS & FRS : Oct.–June

Typha elephantina Roxb. Fl. Ind. 3:566. 1832; C 3:326; S & J 50.

According to Cooke (1958) it is an ornamental plant; but Thaker J. L lists only this species as growing in non–salty, moist ground in Kutch (1926) and Saurashtra (1910) and probably, on this authority alone, Santapau & Janardhanan (1967) might have inclued it in their list. I have not seen this species and the key given above is taken from Duthie (*Fl Upper Gangetic Plain* 2:358. 1960 reprinted).

ARACEAE

Key to genera

1. Floating herbs; leaves obovate–cuneate.. .. . *Pistia*
1. Herbs often of marshy places but not floating; leaves not as above :
   2. Leaves many :
      3. Leaves petiolate, ovate–to ovate–orbicular, peltate; spadix pale–to creamy–yellow. not tubular.. .. . *Colocasia*
      3. Leaves sessile, linear–lanceolate; spathe greenish–brown, tubular.. .. .. *Cryptocoryne*
   2. Leaf 1(-2) :
      4. Leaves and flowers appear together; spathe hood–like, with a long tail at tip.. .. .. ..*Arisaema*
      4. Leaves appear before flowers; spathe not as above :
         5. Leaves 3–partite, each segment secondarily and tertiarily lobed.. .. .. ..*Amorphophallus*
         5. Leaves pedatisect.. .. .. ..*Sauromatum*

AMORPHOPHALLUS Bl. ex Decne. nom. cons.

Key to species

1. Male and female inflorescences contiguous; neuters absent :
   2. Spathe greenish–pink, 15–20 cm broad; appendix massive, amorphous, dark–purple.. .. .. ..*A. campanulatus*
   2. Spathe brownish–purple, 5–13 cm broad; appendix terete, smooth, cream–coloured... .. .. ..*A. commutatus*
1. Male and female inflorescences distinct; neuters distinct .. .. *A. sylvaticus*

Amorphophallus campanulatus (Roxb.) Bl. ex Decne. in Nouv. Ann. Mus. Par. 3:366. 1834; FBI 6:513; C 3:336. WI 1:69. Pl. 11(4). *Arum campanulatum* Roxb. Pl. Cor. 3:68. t. 272. 1819.

Cultivated at some places for the corms used as vegetables. (SURAN)

FLS : Apr.

Amorphophallus commutatus (Schott) Engler in DC. Mon. Phan. 2:319. 1879 & Pfreich. 48:95. 1911; C 3:337; Ch & O 228; S & J 50; S 291. *Conophallus commutatus* Schott in Bonpl. 7:28. 1859. *Amorphophallus sylvaticus* Dalz. & Gibs. Bombay Fl. 256. 1861 (non Kunth 1841).

Perennial herbs. Leaf only one, 30–45 cm across, deeply variously lobed; lobes 4.5–17×3.5–6.5 cm, glabrous, elliptic–lanceolate. Scapes 30–60 cm tall. Spathe 17–22×6–7 cm, ovate–lanceolate. Spadix columnar, as long as spathe, fertile region 6–8 cm long, male flowers above, female below. Ripe berries 0.8–1 cm long, deep–orange.

Throughout in deciduous forests in shade; quite frequent. (JANGLI SURAN)

FLS : Mar.–July. *FRS* : July, occasionally upto Oct.

Amorphophallus sylvaticus (Roxb.) Kunth, Enum. 3:34. 1841. *Arum sylvaticum* Roxb. Fl. Ind. 3:511. 1832. *Synantherias sylvatica* Schott, Gen. Aroid t. 28. 1858; FBI 6:518; C 3:340.

Scanned by CamScanner

Perennial herbs with spherical corm. Leaf 24–26 cm long; lamina primarily 3-sect, each segment 2-or more-sect; lobes 12.5-27×2.4-4.6 cm, glabrous, elliptic-lanceolate.

Rajpipla, Chhotaudepur and Panchmahals; rare. (JANGLI SURAN)

FLS & FRS : Not seen.

ARISAEMA Mart.

Key to species

1. Leaf segments radiatisect .. .. *A. neglectum*
1. Leaf segments pedatisect .. .. *A. tortuosum*

Arisaema neglectum Schott in Bonpl. 7:26. 1859; FBI 6:504; S 290. *Arisaema tortuosum* (Wall.) Schott var. *neglectum* (Schott) Fischer in Gamble, Fl. Madras Pres. 1585. 1931 & 3:1105. 1957 (reprinted).

Erect, perennial herbs; tubers spherical, 2-3 cm across. Leaf 1 or 2, palmatisect; segments 5-7(-3), 9.5-20×3.5-9.5 cm, elliptic or elliptic-obovate. Spathe cucullate, tube 3-5 cm long, limb 6-8 cm long; sterile part of spadix as long as or longer than limb, caudate at tip. Berries yellow or orange-red.

Dangs and Pavagadh; common in Dangs.

FLS : July-Aug. *FRS :* Aug.-Sep.

Arisaema tortuosum (Wall.) Schott, Melet. 1:17. 1832; FBI 6:502; C 3:331. *Arum tortuosum* Wall. Pl. As. Rar. 2:10. 1830.

Tuberous herbs. Leaf solitary, segments 5-7, 9.5-24×4-13.8 cm, broadly ovate-elliptic or obovate. Spathes bright-green to pale-yellow, cucullate, tube 3-5 cm long, limb 5.8×4-5 cm, sterile part of spadix much exerted and caudate at tip.

Dangs; common.

FLS : Aug.

COLOCASIA Schott

Colocasia esculenta (L.) Schott in Schott & Endl. Melet. 1:18. 1832; Bailey 189; WI 2:310. ff. 118; S & J 50; S 293. *Arum esculentum* L. Sp. Pl. 965. 1753. *Colocasia antiquorum* Schott in Schott & Endl. Melet. 1:18 1832; FBI 6:523; C 3:340.

Perennial herbs, with globose corm. Leaves 5.5-45×4.2-20 cm, dark-green or pale-greenish-yellow, glabrous, cordate or sagittate at base. Spathes 25-40 cm long, pale-yellow or creamy-yellow, glabrous. Spadix shorter than spathes. Berries several, reddish-yellow or orange, angular.

Throughout under cultivation or wild in waste, moist places.

FLS : Aug.-Sep. *FRS :* Oct.

CRYPTOCORYNE Fisch.

Cryptocoryne retrospiralis Kunth, Enum. 3:12. 1841; FBI 6:493; C 3:329. *Cryptocoryne roxburghii* Dalz. & Gibs. Bombay Fl. 259. 1861 (non Schott 1832).

Perennial acaulescent herbs. Leaves 10-25×0.5-0.8 cm. Flowers minute, in short, cylindric spikes at base of spathe.

In water-logged stony ground in the forests of south Gujarat; locally abundant, gregarious.

FLS & FRS : Dec.-Jan.

PISTIA L.

Pistia stratiotes L. Sp. Pl. 963. 1753; FBI 6:497; C 3:328; S & J 50. *Pistia stratiotes* L. var. *cuneata* Engl.; WI 8:124.

Stoloniferous herbs. Leaves 2-6×1.5-3 cm, tufted, sessile, densely pubescent. Spathes 1-1.8 cm long, greenish-white or pale-yellow, contracted about middle. Spadix shorter than spathe.

Abundant in ponds and ditches in central Gujarat (Panchmahals), north Gujarat (Idar, Khedbrahma) and Saurashtra. Santapau has also collected it from Dangs. (JALSANKHALA)

FLS & FRS : Sep.-Jan.

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SAUROMATUM Schott

Sauromatum venosum (Ait.) Kunth, Enum. Pl. 3:28. 1837; WI 9:239. *Arum venosum* Ait. Hort. Kew 3:315. 1811. *Arum guttatum* Wall. Pl. As. Rar. 2:10. t. 115. 1813. *Sauromatum guttatum* (Wall.) Schott, Melet. 1:17. 1832; FBI 6:508; C 3:335; S & J 50.

Corm bearing herbs. Leaf solitary, segments 7–13, 5–30 × 2–10 cm, elliptic-lanceolate or ovate-lanceolate, glabrous. Spathes greenish-brown, fowl-smelling.

Throughout, in deciduous forests; rather rare.

FLS : Mar.–Apr.

LEMNACEAE

Key to genera

1. Fronds with roots; male flowers in pair, one on either side of the solitary female flower :
   2. Fronds with several roots.. .. .. .. *Spirodela*
   2. Fronds with one root.. .. .. .. *Lemna*
1. Fronds rootless; male and female flowers solitary.. .. *Wolffia*

LEMNA L.

Key to species

1. Fronds tailed :
   2. Fronds asymmetric, obovate or obovate-oblong, margins smooth.. .. .. *L. paucicostata*
   2. Fronds symmetric, young ones hastate, other set crosswise to young ones, elliptic-lanceolate or oblanceolate, margin near tip serrate.. .. .. *L. trisulca*
1. Fronds not tailed.. .. .. *L. gibba*

Lemna gibba L. Sp. Pl. 970. 1753; FBI 6:556; C 3:343.

Floating herbs. Fronds obovoid to nearly orbicular, flat above, slightly convex beneath; root tip acute, enclosed in unappendaged sheath. Flowers not seen.

Throughout in ponds and ditches; common.

FLS & FRS : Not seen.

Lemna paucicostata Hegelm. Lemnaceae 139. t. 8. 1868; FBI 6:556; WI 6:59.

43414

Floating herbs; fronds 0.1–0.3 cm long, flat, entire, broadly obtuse at apex. Flowers minute in marginal pouches of fronds, males in pairs, one on either side of solitary female. Utricles minute, ovoid.

Common in ponds at north Gujarat (Kadi), central Gujarat (Tuwa) and south Gujarat (Bulsar).

FLS & FRS : Oct.

Lemna trisulca L. Sp. Pl. 970. 1753; FBI 6:557; C 3:343 S & J 50.

Fronds submerged, 0.4–0.8 cm long, thin, flat. Young fronds at right angles from one or both sides of parent frond.

Saurashtra and south Gujarat, in ditches.

FLS & FRS : Not seen.

SPIRODELA Schleid.

Spirodela polyrrhiza (L.) Schleid. in Linnaea 13:392. tt. 5 & 6. 1839. *Lemna polyrrhiza* L. Sp. Pl. 970. 1753; FBI 6:557; C 3:343.

Floating herbs; fronds herbaceous, broadly obovate or almost orbicular, thick, flat above, convex below. Flowers in marginal clefts of fronds. Spathe 2-lipped. Male flowers in pairs, female flower solitary.

Common in ponds and ditches.

FLS : Sep.–Oct.

WOLFFIA Horkel ex Schleid.

Key to species

1. Fronds subglobose beneath.. .. .. .. *W. arrhiza*
1. Fronds subcylindric or conical beneath.. .. *W. microscopica*

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Wolffia arrhiza (L.) Wimmer, Fl. Schles. 140. 1857; FBI 6:557; Subramanyam, Aq. Angio. 79. 1962. *Lemna arrhiza* L. Mant. 2:294. 1771. *Wolffia michelli* Schleid. Beitr. Bot. 233. 1844; C 3:344.

Floating herbs; fronds 0.5–2 mm long, subglobose or oblong, green, glabrous. Male and female flowers solitary, inserted in a cup-like groove on the upper surface of frond.

Throughout in ponds and ditches.

FLS : Sep.

Wolffia microscopica (Griff) Kurz in Journ. Linn. Soc. 9:265. 1867; FBI 6:558; Shah & Deshpande in Journ. Bombay nat. Hist Soc. 64(3):558. 1967. *Grantia microscopica* Griff. Notul. 3:226. 1845.

Floating herbs; fronds ovate or obovate, glabrous, entire, flat above. Male and female flowers solitary, inserted in groove on upper surface of frond.

North Gujarat (Mahudi) and central Gujarat (Tuwa).

FRS : Sep.–Oct.

ALISMATACEAE 141

Key to genera

1. Stamens 6; carpels 15–20, crowded on a minute, flat receptacle; achenes swollen, rounded in cross section.. ..*Limnophyton*

1. Stamens usually many, rarely as few as 6; carpels very many, crowded on globose or oblong receptacles; achenes compressed. ..*Sagittaria*
.. ..

LIMNOPHYTON Miq.

Limnophyton obtusifolium (L.) Miq. Fl. Ind. Bat. 3:242. 1855; FBI 6:560; C 3:345; S & J 50. *Sagittaria obtusifolia* L. Sp. Pl. 993. 1753.

Perennial, scapigerous herbs, with a stout root-stock. Leaves 10–15 × 7.4–9.3 cm, broadly ovate-triangular, caudate-sagittate at base, petiolate. Flowers pale-blue to almost white, whorled on 15–24 cm long scape. Achenes 0.3–0.4 cm long, obovoid, compressed, with a cuneate base, black, glabrous.

Throughout (except Kutch) along margins of ponds, ditches etc.; common.

FLS & FRS : Sep.–Feb.

SAGITTARIA L.

Key to species

1. Leaves floating, broadly ovate, obtuse at apex, deeply cordate at base; stamens 6–10 in male flowers, 9–12 in bisexual flowers; achenes surrounded by broad, blunt-spiny wing .. ..*S. guayanensis* subsp. *lappula*

1. Leaves raised above surface of water, hastate or sagittate, acute to acuminate at apex, basal lobes usually diverging caudate-acuminate; stamens about 24 in male flowers, reduced or staminodes in female flowers.. .. ...*S. sagittifolia*

Sagittaria guayanensis H. B. & K. subsp. **lappula** (D. Don) Bogin. in Mem. N. V. bot. Gdn. 9:192. f. 5. 1955; Subramanyam, Aq. Angio. 87. 1962. *Sagittaria guayanensis* Sensu Hk. f. in Hk. f. FBI 6:561. 1893 (p. p., non H. B. & K.); WI 9:168.

There is but one specimen of this taxon, collected from Baroda by B. B. Joshi, in the Blatter Herbarium and it is the sole authority of its inclusion in the present work.

Sagittaria sagittifolia L. Sp. Pl. 2:993. 1753; FBI 6:561; C 3:345; WI 9:167.

Scapigerous herbs, with stoloniferous root-stocks. Leaves radical, glabrous, 5–11 × 0.8–1.2 cm. Flowers white or tinged pink, 3-6 whorled on a scape. Achenes 0.4-0.5 cm long, obliquely obovate, flattened, apiculate, winged.

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Broach, Rajpipla Chhotaudepur and north Gujarat (Sabarmati river bed) ; rare.

FLS & FRS : Dec.–Feb.

BUTOMACEAE 142

TENAGOCHARIS Hochst.

Tenagocharis latifolia (D. Don) Buchen. Abh. Nat. Ver. Bremen 2:2, 3 & 6. 1968 & Pfreich. 16c : 7. f. 3. 1903. *Butomus latifolius* D. Don, Prodr. Fl. Nep. 22. 1825. *Butomopsis lanceolata* Kunth, Enum. Pl. 3:165. 1841; FBI 6:562; C 3:347.

Scapose, perennial herbs, 10–30 cm tall, with milky sap. Leaves 3–9×0.9–3 cm, oblong–lanceolate or oblanceolate, glabrous. Flowers white or pale–blue, 2–16, in terminal umbels. Follicles 0.5–1.2 cm long. Seeds minute, several, brown, shining.

In moist ground, at Dangs, Navsari (Chikli), Baroda, Panchmahals (Tuwa) and north Gujarat (Ahmedabad, Talod); rare.

FLS & FRS : Sep.–Nov.

POTAMOGETONACEAE 143

POTAMOGETON L.

Key to species

1. Upper or all leaves floating.. .. .. ..*P. nodosus*

1. All leaves submerged :

2. Leaves filiform.. ... .*P. pectinatus*

2. Leaves not filiform :

3. Leaves ovate, entire, 5–9–nerved, amplexicaul at base .. ..*P. perfoliatus*

3. Leaves linear–oblong, crisped, transluscent, rounded or ½ amplexicaul at base.. .. .. ..*P. crispus*

Potamogeton crispus L. Sp. Pl. 126. 1753; FBI 6:566; C 3:350; WI 8:221.

Submerged, slender, simple or branched, flaccid, glabrous herbs. Leaves 2.5–5.5×0.6–1.5 cm, finely serrulate on margins, sessile. Spikes 0.8–2 cm long, terminal, compact.

In ponds and ditches (except Kutch and Saurashtra); locally abundant.

FLS & FRS : Dec.–Jan.

Potamogeton nodosus Poir. in Encycl. Meth. Bot. Suppl. 4:535. 1816; S & J 50. *Potamogeton indicus* (non Roth ex R. & S. 1818); Roxb. Fl. Ind. 1:470. 1820; FBI 6:565; C 3:349.

Submerged, rooted, slender herbs. Leaves 2.5–7.5×1.5–2.5 cm, floating, elliptic–oblong to elliptic–lanceolate, glabrous, petiolate. Flowers pink, in 2–4.5 cm, compact, terminal spikes. Drupes ovoid, glabrous, shortly beaked.

Throughout in ponds and ditches; locally abundant.

FLS & FRS : Almost all the year round.

Potamogeton pectinatus L. Sp. Pl. 127. 1753; FBI 6:567; C 3:350; S & J 50; WI 8:221.

Filiform, much branched, aquatic herbs. Leaves 2–10 cm long. Flowers white, in short, compact spikes.

Throughout in ponds and ditches; locally abundant.

FLS & FRS : Not seen.

Potamogeton perfoliatus L. Sp. Pl. 126. 1753; FBI 6:566; C 3:349; S & J 50.

Dichotomously branched, submerged, slender, glabrous herbs. Leaves 1.5–3.7×0.8–1 cm, glabrous, flaccid.

Throughout in ponds and ditches in plains.

FLS & FRS : Not seen.

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NAJADACEAE 144

NAJAS L.

Key to species

1. Male flowers enclosed in a spathe :
   2. Leaves 0.2–0.3 cm broad, fleshy.. .. .. ..*N. marina*
   2. Leaves upto 0.1 cm broad, not fleshy :
      3. Leaves coarsely dentate; flowers solitary; seeds upto 0.25 0.3 cm long; areole on testa much broader than long.. .. ..*N. minor*
      3. Leaves with (30–) 50–60 spines on each side; flowers aggregated; seeds upto 0.2 cm long; areole on testa as long as broad.. .. .. .. *N. kurziana*
1. Male flowers not enclosed in a spathe.. .. .. *N. graminea*

Najas graminea Del. Descr. Egypt. Hist. Nat. 2:231. t. 50. f. 3. 1813 & Fl. Egypt. 138. t. 50. f. 3. 1813; FBI 6:569; S & J 50.

Grass-like, submerged herbs. Leaves 1.5–3 cm long, very narrowly linear, flat, inconspicuously spinous-toothed on margins, sheathing at base; sheath long auricled, auricles lanceolate, dentate. Flowers 1–3-together, male and female flowers espatheate. Achenes minute.

Listed by Santapau & Janardhanan (1967) from Saurashtra.

FLS & FRS : Mar.–Apr.

Najas kurziana Rendle, Trans. Linn. Soc. Bot. 5:413. t. 41. ff. 116–121. 1899; Prain, Bengal Pl. 847. 1963 (reprinted); Shah & Deshpande in Journ. Bombay nat. Hist. Soc. 64(3) : 587. 1967.

Submerged herbs, rooting at lower nodes. Leaves 1-2.5 × 0.05-0.1 cm, sessile, whorled, flat. Flowers axillary, in fascicles of 2-4, male spathaceous, female espathaceous. Achenes ovoid or subglobose.

Panchmahals (Tuwa) from a pond; rare.

FLS & FRS : Sep.

Najas marina L. SP. Pl. 1015. 1753 (incl. var. β & γ); S & J 50 : Shah et al. in Journ. Bombay nat. Hist. Soc. 65 (1) : 260–262. 1968. *Najas major* All. Fl. Ped. 2:221. 1785; FBI 6:569.

Slender, submerged, rooted herbs; stem and branches pale-green, somewhat flattened, with scattered spinous teeth. Leaves 0.6–1.5 cm long, blunt or acute at apex, sharply spinous-toothed on margins. Male flowers spathaceous, mostly solitary, female ones espathaceous, solitary or 2 (–3)-fascicled. Fruits 0.25–0.3 cm long, ellipsoid, glabrous, minutely punctulate.

Kutch, Saurashtra, north Gujarat, Rajpipla and Broach; locally abundant.

FLS & FRS : Jan. – Apr.

Najas minor All. Fl. Pedem. 2:221. 1785; FBI 6:659; C 3:352; S & J 50.

Submerged, aquatic herbs. Leaves 1–3.2 cm long, flat, linear-lanceolate, margins with 6–12, very minute teeth. Flowers monoecious, axillary, solitary, male spathaceous with persistent perianth; female espathaceous. Achenes oblong.

Throughout, in ponds, ditches etc., locally abundant.

FLS & FRS : Sep.–Oct.

APONOGETONACEAE 145

APONOGETON L. f.

Aponogeton natans (L.) Engl. & Krause in Engl. Pfreich. 24 : 11. t. 1A. 1906. *Saururus natans* L. Mant. 2:227. 1771. *Aponogeton monostachyon* L. f. Suppl. 214. 1781; FBI 6:564; C 3:348.

Aquatic, submerged herbs. Leaves 7.5-20 × 3.2-5 cm, oblong or linear-oblong, glabrous, petiolate. Spikes 3-5 cm long, compact, cylindric. Flowers bright-pink or white. Follicles 0.3–0.5 cm long, beaked.

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In ponds in south Gujarat, central Gujarat (Kaira district, Panchmahals) and north Gujarat; not common.

FLS & FRS : July-Aug.

ZANNICHELLIACEAE 146

ZANNICHELLIA L.

Zannichellia palustris L. subsp **pedicellata** Wahlenb. & Rosin. in Nov. Act. Upsal. 8:227. 1821; FBI 6:568; C 3:351.

Slender, almost filiform, submerged herbs of fresh or brackish water. Leaves 2–5 cm long, alternate or opposite, very narrowly linear or filiform. Flowers minute, pinkish, subsessile, enclosed in the leaf sheaths. Achenes minute, stipitate, beaked.

Listed by Saxton & Sedgwick (1918) from north Gujarat as "abundant in rivers".

FLS : Dec.–Feb.

RUPPIACEAE 147

RUPPIA L.

Ruppia maritima L. Sp. Pl. 127. 1753; McCann in Journ. Bombay nat. Hist. Soc. 45:396. ff. 1–12. 1945; S & J 50. *Ruppia rostellata* Koch. ex Reichb. Ic. Pl. Crit. 2:66. t. 174. f. 306. 1824; FBI 6:568; C 3:351.

Submerged, slender to almost filiform, flaccid herbs of brackish water. Leaves 5–10 cm long, filiform. Flowers minute, paired, in leaf-sheaths. Achenes very minute, stipitate, beaked, arranged in an umbellate head.

Listed by Santapau & Janardhanan (1967) from Saurashtra.

FLS & FRS : Dec.–Feb.

ERIOCAULACEAE 148

ERIOCAULON L.

Key to species

1. Receptacle glabrous; involucral and floral bracts both glabrous .. ..*E. truncatum*

1. Receptacle villous; involucral bracts glabrous, floral bracts bearded or pubescent :
   2. Floral bracts scabrid or puberulous; female sepals strongly boat-shaped and crested on the keel or at least enlarged.. .. ..*E. eleanorae*
   2. Floral bracts hairy; female sepals flat or if boat-shaped not as above :
      3. Female petals absent; involucral bracts erect or finally spreading but not reflexed, exceeding the floral bracts .. ..*E. achiton*
      3. Female petals present; involucral bracts at length reflexed or spreading, not longer than floral bracts :
         4. Heads 0.3–0.5 cm across.. .. ..*E. sollyanum*
         4. Heads 0.6–0.8 cm across :
            5. Female sepals all similar.. ..*E. quinquangulare*
            5. Female sepals dissimilar, one flat or linear :
               6. Involucral bracts longer than head; third sepal flat.. .. ..*E. dianae* var. *dianae*
               6. Involucral bracts much longer than capitulum; third sepal broadly linear.. .. ..*E. dianae* var. *longibracteatum*

Eriocaulon achiton Koern. in Linnaea 27:630. 1854; FBI 6:584; Fyson in Journ. Ind. Bot. 2:202. fig. on p.203. 1921.

Small, scapigerous herbs. Leaves 1–2.5 cm long, narrowly linear. Scapes 3–8 cm long, slender. Head obconic or hemispheric. Seeds broadly ovate, dark-brown.

Dangs (Unai to Kalankara); collected by Santapau (*HS* 17150).

FLS & FRS : Nov.

Eriocaulon dianae Fyson var. **dianae**; S & J 50; S 293. *Eriocaulon dianae* Fyson var. *typica* Fyson in Journ. Ind. Bot. 2:259. Pl. 11. 1921.

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Small herbs. Leaves 2–10×0.5–0.8 cm, lanceolate. Heads hemispherical, on 8–20 cm. long, glabrous scapes. Capsule glabrous. Seed minute, light-brown.

In moist ground in south Gujarat (Dharampur) and Saurashtra.

FLS & FRS : Sept.–Nov.

Eriocaulon dianae Fyson var. **longibracteatum** Fyson in Journ. Ind. Bot. 2:25. Pl. 13. 1921; S & J 50; S 294.

Scapigerous herbs. Leaves 2.5–5.5×0.4–1 cm, lanceolate. Scape 8–12 cm long, terete, slender, glabrous. Heads terminal, hemispherical.

In moist ground in south Gujarat (Dangs, Surat) and Saurashtra; rare.

FLS & FRS : Oct.–Nov.

Eriocaulon eleanorae Fyson in Journ. Ind. Bot. 2:316. 1921; S 294.

Tufted herbs. Leaves 1.5–5.5 cm long, acicular or subulate, glabrous, sharply acuminate at apex. Heads monoecious, 0.2–0.4 cm across, hemispheric, terminal, 4.5–12.5 cm long scapes. Ovary 3-gonous. Seeds 3, dark-brown, glabrous, shining.

In drying moist ground in south Gujarat (Dharampur, Bulsar) central Gujarat (Panchmahals) and north Gujarat (Idar); locally frequent.

FLS & FRS : Sept.–Oct.

Eriocaulon quinquangulare L. Sp. Pl. 87. 1753; FBI 6:582; C 3:361.

Scapigerous herbs. Leaves 1.5–5.6×0.2–0.4 cm, linear-lanceolate, flat, acuminate. Scape 4–15 cm long, glabrous, 5-ribbed. Heads terminal, globose. Ovary 3-lobed, minute.

Dangs, in drying ground and cultivated fields; common.

FLS & FRS : Sept.–Nov.

Eriocaulon sollyanum Royle, Ill. 409. t. 97. f. 1. 1839; S & J 51; S 294. *E. trilobum* Buch.-Ham. ex Koern. in Linnaea 27:645. 1856; FBI 6:583; C 3:361; Fyson in Journ. Ind. Bot. 2:206. 1921.

Scapigerous herbs. Leaves 1.7–5×0.1–0.3 cm, narrowly linear, flat. Scape 8–15 cm long. Heads terminal, subglobose. Ovary 3-lobed. Seeds minute, ellipsoid, microscopically transversely ridged, pale-yellow.

Dangs (Unai, Dungarda) and Saurashtra.

FLS & FRS : Oct.

Eriocaulon truncatum Buch.-Ham. ex Mart. in Wall. Pl. As. Rar. 3:29. 1832. FBI 6:578; Fyson in Journ. Ind. Bot. 2:199. 1921.

Scapigerous herbs. Leaves 2–4×0.2–0.4 cm, flat, linear. Scape 5–10 cm long, glabrous. Heads terminal, hemispherical. Ovary 3-lobed.

Saurashtra (Sasangir, *HS* 16363).

FLS & FRS : Oct.

CYPERACEAE 149

Key to genera

1. Spikelets unisexual :
   2. Nut enclosed in utricle.. .. .. *Carex*
   2. Nut not enclosed in utricle .. .. *Scleria*
1. Spikelets bisexual :
   3. Glumes distichously arranged.. .. .. .. *Cyperus*
   3. Glumes spirally arranged :
      4. Hypogynous bristles absent :
         5. Style base swollen :
            6. Style base persistent, button-shaped .. *Bulbostylis*
            6. Style base not persistent.. .. *Fimbristylis*

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5. Style base not swollen :
   7. Spikelet one-flowered.. .. ..*Remirea*
   7. Spikelet many-flowered.. .. ..*Scirpus*
4. Hypogynous bristles present :
   8. Inflorescence always a solitary spikelet..*Eleocharis*
   8. Inflorescence a panicle, an umbel or reduced to a capitate head :
      9. Spikelet many-flowered :
         10. Hypogynous bristles 3-6, always petaloid (absent in *F. pubescens*) .. .. *Fuirena*
         10. Hypogynous bristles 4-7, never petaloid or dissected.. .. .. ..*Scirpus*
         10. Hypogynous bristles 6, much dissected into thread-like segments .. *Eriophorum*
      9. Spikelet one-flowered .. .. *Rhynchospora*

BULBOSTYLIS Kunth nom. con.

Key to species

1. Spikelets few to many, in dense, terminal (or pseudolateral) heads; glumes 3- nerved; keel serrulate; stamen 1 ..*B. barbata*
1. Spikelets in simple or compound, lax umbels; glume 1-nerved; keel not serrulate; stamens 2... .. .. *B. densa*

Bulbostylis barbata (Rottb.) Cl. in Hk. f. FBI 6:651. 1893. *Scirpus barbatus* Rottb. Descr. et Icon. 52. t. 17. f. 4. 1773. *Stenophyllus barbata* Cooke, Fl. Pres. Bombay 2:387. 1908 & 3:401. 1958 (reprinted).

Annual, tufted, glabrous herbs, 5-30 cm tall. Leaves as long as or shorter than stem, very narrowly linear, glabrous. Spikelets 0.3-1 cm long, sessile, linear-lanceolate, ovate-lanceolate or ellipsoid, digitately arranged in a head. Nut minute, obovoid-trigonous, microscopically transversely punctate.

Throughout, among grasses, common.

FLS & FRS : July-Jan.

Bulbostylis densa (Wall.) Hand.-Mazz. in Karsten & Schenk. Vegetationsb. 20 (7) : 16. 1930; S 303. *Scirpus densus* Wall. in Roxb. Fl. Ind. 1:231. 1820. *Isolepis trifida* Nees in Wt. Contrib. Ind. 108. 1834. *Bulbostylis capillaris* Kunth var. *trifida* (Nees) Cl. in Hk. f. FBI 6:652. 1893.

Annual, tufted, glabrous, slender herbs. Leaves 2-8 cm long, narrowly linear. Spikelets 0.2-0.5 cm long, oblong-obovate to oblong-lanceolate. Nut minute, oblong-obovoid or oblong-ellipsoid, minutely vertically punctate.

North Gujarat (Vijalasan); not frequent.

Spikelets : Aug.-Sep.

CAREX L.

Key to species

1. Spikes monoecious, female below, male above....*C. myosurus*
1. Spikes dioecious, upper 2-3 male, rest female.. ..*C. fedia*

Carex fedia Nees ex Wt. Contrib. Bot. India 129. 1834. *Carex wallichiana* Presc. in Wall. Cat. no. 3380. 1828 ex Nees in Wt. Contrib. Bot. India 129. 1834 (non Spr. 1826); FBI 6:747; Kuekenth. in Pfreich. 38:749. 1909.

Perennial, 32-65 cm tall, stoloniferous, glabrous herbs. Leaves 3-5, 30-45 cm long, narrowly linear-lanceolate, scabrid on margins. Spikes distantly arranged, terminal. Utricle ovate, oblong or lanceolate, densely hirsute. Nut oblong-obovate to ovate-lanceolate, trigonous, shortly beaked, vertically punctate.

Listed by C. K. Shah (1963) from north Gujarat (without locality).

Carex myosurus Nees in Wt. Contrib. Bot. India 122. 1834; FBI 6:723; Kuekenth. 38:258.

Perennial, stoloniferous, glabrous, 35-42 cm tall herbs. Leaves 4-6, 19-32 cm long, narrowly linear-lanceolate, glabrous,

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scabrid. Spikes distant, terminal, 1–5 cm long. Utricle 0.2–0.23 cm long, densely hairy, toothed in upper half. Nut oblong-obovate.

Listed by C. K. Shah (1963) from north Gujarat (Shaktinagar).

CYPERUS L.

Key to species

1. Spikelets many-flowered; rachilla of spikelet persistent :
   2. Stigmas 2; nut not at all trigonous (Stigmas 2–3 and at times nut trigonous in *C. michelianus* subsp. *pygmaeus*) :
      3. Nut compressed laterally :
         4. Superficial cells of the nut longitudinally oblong or elliptic; nut often appearing zonate or muricate by reason of thickened ends of cells running into undulating or broken horizontal lines :
            5. Plants rhizomatous; spikelets ovate-oblong or oblong-lanceolate, 20–60-flowered..*C. diaphanus*
            5. Plants not rhizomatous; spikelets linear or linear-oblong, upto 20-flowered :
               6. Glume dark-brown or deep-chocolate-brown; nut globosely ovoid, brown or blackish-brown .. .. *C. malabaricus*
               6. Glume pale-yellow or straw-coloured; nut obovoid .. ..*C. flavescens*
         4. Superficial cells of the nut nearly square; nut often appearing dotted by reason of the light reflected from the convex surface of each cell :
            7. Stem leafy for more than half its length, decumbent; rhizome creeping.. ..*C. sanguinolentus* subsp. *sanguinolentus*
            7. Stem leafy only at base, erect; rhizome if present not as above :
               8. Annuals, tufted; stem slender :
                  9. Rachilla of spikelets distinctly winged; glumes not keeled; spikelets 6–10-flowered .. .. *C. hyalinus*

                  9. Rachilla of spikelets not winged; glumes keeled; spikelets 20–50-flowered :
                     10. Glumes mucronate :
                        11. Spikelets linear-oblong, 10-20-flowered; bracts not membranous .. .. .. *C. pumilus* var. *pumilus*
                        11. Spikelets linear, 30–40-flowered; bracts membranous ..*C. pumilus* var. *membranaceus*
                     10. Glumes obtuse :
                        12. Spikelets yellowish-or reddish-brown, 0.15–0.2 cm broad .. .. *C. flavidus* var. *flavidus*
                        12. Spikelets pale-straw-coloured. 0.07–0.1 cm broad...*C. flavidus* var. *strictus*
               8. Perennials, not tufted; stem robust :
                  13 Inflorescence a globose or 3-lobed head .. ..*C. polystachyos* var. *polystachyos*
                  13. Inflorescence a lax umbel..*C. polystachyos* var.. *laxiflorus*
      3. Nut dorsally compressed :
         14. Spikelets in a decompound umbel..*C. alopecuroides*
         14. Spikelets in a head :
            15. Perennials; head apparently lateral...*C. laevigatus*
            15. Annuals; head terminal.. ..*C. michelianus* subsp. *pygmaeus*
   2. Stigmas 3; nut always trigonous :
      16. Bracts 17–20.. .. ..*C. flabelliformis*
      16. Bracts 3-9 :
         17. Spikelets digitate or clustered, not spicate or racemose .
            18. Annuals :

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19. Spikelets few, digitate; nut warted; rachilla flexuous, not winged.. ..*C. tenuispica*
19. Spikelets numerous, clustered in a head; nut punctate; rachilla not flexuous, shortly winged.. .. .. *C. difformis*

18. Perennials :
20. Inflorescence a lax umbel .. *C. haspan*
20. Inflorescence more or less globose, terminal head :
21. Roots not woolly :
22. Glume multinerved :
23. Rachilla flexuous; nut elliptic-obovate, obovoid or oblong-ellipsoid, brownish-black, punctate.. *C. niveus*
23. Rachilla not flexuous; nut obovate, silvery-greyish-brown, smooth..*C. arenarius*
22. Glume one-nerved; nut oblong or elliptic-obovate, punctate .. .. ..*C. leucocephalus*
22. Glume 3-nerved; nut more or less globose, obovate.. .. .. *C. atkinsonii*
21. Roots woolly :
24. Head of 29-35 spikelets; each spikelet 20-40 flowered.. .. .. *C. conglomeratus*
24. Head of 7-19 spikelets; each spikelet 8-18 flowered .. .. *C. pachyrhizus*

17. Spikelets distinctly spicate, rarely subracemosely disposed :
25. Rachilla of spikelet not or hardly winged (*C. squarrosus*) :
26. Annuals with tufted stem :
27. Glumes cuspidate or aristate; slender or tiny herb ;

28. Glumes aristate; spikelets 1-1.5 × 0.08-0.1 cm, yellowish-brown..*C. squarrosus*
28. Glumes cuspidate; spikelets 1.2-6 × 0.1-0.4 cm, pale-straw or greenish.. .. .. *C. compressus*
27. Glumes obtuse or minutely mucronate; relatively stout herbs :
29. Glume dorsally 3-5-nerved; back smooth :
30. Spikes not drawn out into linear racemes.. .. ...*C. iria* var. *iria*
30. Spikes drawn out into linear racemes.. ..*C. iria* var. *panciformis*
29. Glume dorsally 5-7-nerved; back spinulose-ciliate.. .. ..*C. alulatus*

26. Perennials with woody rhizome and often long stolons :
31. Spikelets crowded in cylindric spikes; plants without true stolons.. .. *C. nutans* var. *eleusinoides*
31. Spikelts not as above; plants stoloniferous :
32. Spikelets compressed; glume margins distinctly hyaline.. .. ..*C. procerus*
32. Spikelets spicate; glume margins not distinctly hyaline :
33. Mature spikelets acicular, patent; glumes obtuse; nut as long as glume .. .. .. *C. distans*
33. Mature spikelets linear, suberect; glumes minutely mucronate; nut smaller than glume.. ..*C. nutans* var. *nutans*

25. Rachilla of spikelets distinctly winged :
34. Flowering stem leafless; rhizome not creeping .. .. *C. papyrus*
34. Leaves short, rarely half as long as stem or absent and rhizomes short or long creeping :

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35. Stem stout, rush–like; stolons when present stout :

36. Stem articulated when dry :

37. Bracts present, foliaceous; spikes tinged reddish–brown.. .. ..*C. corymbosus*

37. Bracts absent; spikes straw–coloured ... .*C. articulatus*

36. Stem not articulated when dry :

38. Rhizome shortly creeping, not stoloniferous; glumes somewhat remote; culm distinctly trigonous:

39. Rachilla strongly winged .. ..*C. pangorei*

39. Rachilla narrowly winged .. ..*C. macer*

38 Rhizome long creeping, often stoloniferous; glumes remote or imbricating; culm trigonous at apex only .. .. .. *C. bengalensis*

35. Stem slender, grass–like; stolons slender .. ..*C. scariosus*

34. Leaves long, more than half as long as stem or longer :

40. Rhizome stoloniferous :

41. Stolons slender, soon disappearing, terminating into tunicated bulbils; leaves arising from stem at some distance above the base and below the middle.. .. .. ..*C. bulbosus*

41. Stolons slender, persistent, bearing ovoid, black tubers; leaves radical :

42. Leaves flaccid, flat; umbels usually compound :

43. Tubers zoned ... *C. esculentus*

43. Tubers not zoned :

44. Stem at base nodosely thickened and suddenly contracted in a wiry rhizome; stolon tuber bearing.. .. ..*C. rotundus* subsp. *rotundus*

44. Stem at base tuberous, woody; stolons not tuber bearing.. .. .. ..*C. rotundus* subsp. *tuberosus*

42. Leaves rigid; umbel simple, compact.. .. ..*C. stoloniferous*

40. Rhizome not stoloniferous :

45. Ripe spikelets ascending.. .. ..*C. exaltatus* var. *exaltatus*

45 Ripe spikelets rigidly patent.. ..*C. exaltatus* var. *dives*

1. Spikelets few–flowered; rachilla of spikelet deciduous, leaving a disc :

46. Spikelets always in capitate heads; stigmas 2; nut compressed :

47. Rhizome very short or 0 :

48. Keel of nut bearing glume not crested.. .. ..*C. triceps*

48. Keel of nut bearing glume crested and toothed .. ..*C. metzii*

47. Rhizome elongate :

49. Nut bearing glume winged in upper half of keel.. .. ..*C. kyllingia*

49. Nut bearing glume not winged in upper half of keel.. .. ..*C. brevifolius*

46. Spikelets capitate or spicate; stigmas 3; nut not compressed:

50. Glumes prominently winged.. ..*C. pseudokyllingioides*

50. Glumes not winged :

51. Spikelets linear in globose spikes or heads; heads in compound or decompound umbel..*C. compactus*

51. Spikelets in cylindric or oblong spikes :

52. Rhizome often with slender stolons.. ... .*C. paniceus*

52. Rhizome not stoloniferous :

53. Spikelets bearing 4 or more nuts.. .. .. ..*C. cyperoides* var. *subcompositus*

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53. Spikelets bearing 1-2 nut.. .. ..*C. cyperoides* var. *cyperoides*

Cyperus alopecuroides Rottb. Descr. et Icon. 38. t. 8. f. 2.1773; C 3:373; Kuekenth. 71. *Juncellus alopecuroides* (Rottb.) Cl. in Hk. f. FBI 6:595. 1893.

Perennial, rhizomatous, 60–75 cm tall, glabrous herbs. Leaves as long as or shorter than stem, glabrous but for minutely serrulate margins and veins, linear. Inflorescence terminal, lax, often with a central spike; spikes 4–4.5 × 1–2 cm, cylindric; spikelets 0.4–1 cm long, brownish-yellow, ovate-lanceolate or ellipsoid, 30–40-flowered. Nut biconvex, polished, smooth, pale- to dark-blackish-brown.

Throughout in plains; not common.

FLS & FRS : Throughout the year in moist ground.

Cyperus alulatus Kern in Reinwardt. 1(4):463–466. f. 1. 1952; S & J 51; Shah & Suryanarayana in Journ. Bombay nat. Hist. Soc. 66(2):412. 1969. *Cyperus iria* L. var. *rectangularis* Kuekenth. in Pfreich. 101:152. 1935.

Tufted, 5–37 cm tall, glabrous herbs. Leaves 5–40 cm long, linear, glabrous but for serrulate margin near apex. Inflorescence terminal, lax, compound umbel. Spikelets 0.4–1.4 × 0.25–0.3 cm, golden-brown or yellowish-brown. Nut triquetrous, obovate, microscopically punctate.

Throughout in moist ground, often gregarious.

FLS & FRS : Aug.-Dec.

Cyperus arenarius Retz. Obs. 4:9. 1786; FBI 6:602; C 3:378; Kuekenth. 270; S & J 51.

Tufted, rhizomatous, glabrous herbs, 10–40 cm tall. Leaves as long as or shorter than stem, linear, coriaceous. Inflorescence a compact head of 4–10 spikelets. Spikelets 1–1.5 cm long, compressed, 8–20-flowered, linear-lanceolate. Nut triquetrous, smooth, brown or greyish-brown.

Throughout, in sandy ground along sea shores and sandy-loam alluvial river beds; common.

FLS & FRS : June-Dec.

Cyperus articulatus L. Sp. Pl. 44. 1753; FBI 6:611; Kuekenth. 77; S 297.

Perennial herbs, with glabrous stems. Leaves reduced to 7–16 cm long sheath, at times sheath with a short blade. Inflorescence a compound umbel, terminal or pseudolateral. Spikelets 0.3–1.7 cm long, linear-to ovate-lanceolate. Nuts ovate-oblong, trigonous, chestnut-brown or brownish-black, microscopically, obliquely transversely punctate.

North Gujarat (Balaram, Himmatnagar, Ahmedabad) and south Gujarat (Amalsad); rare but subgregarious.

FLS & FRS : June-Jan.

Cyperus atkinsonii Cl. Journ. Linn. Soc. 21:109. 1884; FBI 6:603; C 3:378; Kuekenth. 271.

Rhizomatous, solitary or tufted, 6–15 cm tall herbs. Leaves 2-7 cm long, rigid, narrowly linear, glabrous. Inflorescence a capitate head of 10-17 spikelets. Spikelets 0.2-0.7 cm long, reddish-to yellowish-brown, ovate or linear-lanceolate. Nut ovate-lanceolate, microscopically transversely punctate.

Chhotaudepur forest division among grasses; very rare.

FLS & FRS : Aug.-Sep.

Cyperus bengalensis Spr. Neue Entd. 111. 1822. *Cyperus tegetiformis* Roxb. Hort. Beng. 6. 1814 (nomen) ex Arn. in Wt. Contrib. Bot. India 89.1834; FBI 6:612; C 3:383. *Cyperus corymbosus* Rottb. var. *longispicatus* (O. Ktze.) Kuekenth. in Pfreich. 101:182. 1935.

Perennial, stoloniferous, glabrous, 30–70 cm tall herbs. Leaves usually reduced to 11–13 cm long sheaths or rarely 10–12 cm long, linear, glabrous but for serrulate margins. Inflorescence

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terminal, corymbose, compound umbel. Spikelets 1–1.7 cm long, straw-coloured, linear.

Saurasthra (Rajkot) and Panchmahals (Untadia).

FLS & FRS : Mar.

Cyperus brevifolius (Rottb.) Hassk. Cat. Hort. Begor. 24. 1844; Kuekenth. 600; S 29. *Kyllinga brevifolia* Rottb. Descr. et Icon. 13. t. 4. f. 3. 1773; FBI 6:588.

Creeping, 10–30 cm tall herbs. Leaves 5–15 cm long, glabrous, at times basal leaves reduced to sheaths or sheathing scales. Spikelets 0.2–0.25 cm long, lanceolate or ovate-lanceolate, compact, in terminal heads. Nut reddish-brown, obovate-ellipsoid, biconvex, microscopically punctate.

Panchmahals and Bulsar; not common.

FLS & FRS : Sep.–Oct.

Cyperus bulbosus Vahl, Enum. 2:342. 1806; FBI 6:611; C 3:384; Kuekenth. 125. f. 15 C–E.

Perennial, glabrous, bulbous herbs, 10–40 cm tall. Leaves as long as or shorter than stem, glabrous, linear. Inflorescence a compound umbel or reduced to a capitate head. Spikelets 0.8–1.2 cm long, yellowish-brown to reddish-brown, ovate-lanceolate or linear-lanceolate. Nuts chestnut-brown to blackish-brown, obtusely trigonous, obovoid-oblong, apiculate.

Throughout, common.

FLS & FRS : July-Dec.

Cyperus compactus Retz. Obs. 5:10. 1786; Kuekenth. 423. *Cyperus dilutus* Vahl, Enum. 2:357. 1806; C 3:389. *Mariscus microcephalus* Presl, Relig. Haenk. 1:182. 1830; FBI 6:624. *Mariscus compactus* (Retz.) Druce in Repert. Bot. Exch. Club Brit. Isles 634. 1917.

Perennial, rhizomatous, glabrous, 50–65 cm tall herbs. Leaves 20–80 cm long, linear-lanceolate, glabrous but for serru-

late veins and margins. Inflorescence terminal, a compound umbel. Spikelets 0.5–0.6 cm long, linear-lanceolate, reddish-brown. Nuts triquetrous, blackish-brown, apiculate.

South Gujarat (Dangs and Songadh); very rare.

FLS & FRS : Oct.

Cyperus compressus L. Sp. Pl. 46. 1753; FBI 6:605; C 3:379; Kuekenth. 156. f. 4 A–D; S 297.

4–40 cm tall, erect or diffuse, glabrous herbs. Leaves 8–20 cm long, linear, glabrous, Inflorescence a compound umbel. Spikelets compressed, linear to ovate-lanceolate, Nuts obovoid -ellipsoid, triquetrous, microscopically punctate, shortly beaked.

Throughout, common.

FLS & FRS : July–Oct.

Cyperus conglomeratus Rottb. Descr. et Icon. 21. t. 15. f. 7. 1773; FBI 6:602; C 3:379; S & J 51.

Perennial, tufted, glabrous herbs, 25–40 cm tall. Leaves 15–30 cm long, linear, glabrous. Head terminal, compact. Spikelets compressed, oblong-lanceolate or ovate-lanceolate. Nuts obovoid-trigonous, yellow to yellowish-brown, transversely punctate.

Kutch, Saurashtra and north Gujarat on sandy to sandy-loam soil; not frequent.

FLS & FRS : Aug.–Dec.

Cyperus corymbosus Rottb. Descr. et Icon. 42. t. 7. f. 4. 1773; FBI 6:612; C 3:383; Kuekenth. 80. f. 10; S 298.

Perennial, glabrous, glaucous-green herbs, 40–70 cm tall. Leaves 18–22 cm long, linear, glabrous. Inflorescence terminal, compound umbel. Spikelets ovate to ovate-lanceolate. Nuts as in *C. articulatus*.

Throughout (except Kutch); not common.

FLS & FRS : Nov.–Feb.

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Cyperus cyperoides (L.) O. Ktze. var. **cyperoides.** *Cyperus cyperoides* (L.) O. Ktze. Rev. Gen. Pl. 2:333. 1891; Kuekenth. 514; Ch & O 230 (excl. *M. paniceus* Vahl). *Scirpus cyperoides* L. Mant. 2:181. 1777. *Mariscus sieberianus* Nees in Linnaea 9:289. 1835; FBI 6:622.

Perennial, 20–50 cm tall, rhizomatous, glabrous herbs. Leaves 10–35 cm long, coriaceous, glabrous but for scabrid margins. Inflorescence terminal, compound umbel. Spikelets ovate-oblong or oblong-lanceolate. Nuts chestnut-brown, narrowly fusiform, oblong-lanceolate or oblong-obovate, trigonous, transversely punctate.

North to south Gujarat; not common.

FLS & FRS : July–Jan.

Cyperus cyperoides (L.) O. Ktze. var. *subcompositus* (Cl.) Kuekenth. in Engler, Pfreich. 101:516. 1936; S 298. *Mariscus sieberianus* Nees var. *subcomposita* Cl. in Hk. f. FBI 6:622. 1893. *Cyperus konkanensis* Cooke, Fl. Pres. Bombay 2:874. 1908 & 3:387. 1958 (reprinted).

There is a specimen in the herbarium of BSI, Poona, collected by Jain (no. 43078) from Dangs-Mulchond on 27-8-1958. The herbarium sheet bears the remark "common".

Cyperus diaphanus Schrad. ex R. & S. Mant. 2:477. 1824; Kern in Reinwardt. 6(1):62. 1961; S 298. *Cyperus latespicatus* Boeck. in Flora 42:433. 1859 & in Linnaea 35:467. 1868; C 3:368; Kuekenth. 392. *Pycreus latespicatus* Cl. in Hk. f. FBI 6:590. 1892.

Perennial, glabrous herbs. Leaves 5–7 cm long, linear to linear-lanceolate, glabrous. Inflorescence terminal umbel or reduced to a single head. Spikelets chestnut-brown, compressed. Nuts obovoid-oblong, dark-reddish-brown to nearly black, apiculate, transversely punctate.

North Gujarat (Coteshwar) and central Gujarat (Chhota-udepur forests); rare.

FLS & FRS : Dec.–Apr.

Cyperus difformis L. Cent. Pl. 2:6. 1756; FBI 6:598; Cooke 3:376; Kuekenth. 237. f. 27 F–H; S & J 51; S 298.

Tufted, 10–50 cm tall, glabrous herbs. Leaves 5–30 cm long, linear. Inflorescence terminal, simple or compound umbel, with a sessile, capitate head at base of umbel. Spikelets greenish-brown. Nuts pale-yellow or brown, triquetrous, ellipsoid or obovate-oblong, microscopically punctate.

Throughout; common.

FLS & FRS : Sep.–Dec.

Cyperus distans L.f. Suppl. 103. 1781; FBI 6:60.

Included on the authority of a herbarium card at BSI, Poona bearing a remark "collecter Wadhwa, loc. Dangs".

Cyperus esculentus L. Sp. Pl. 67. 1753; FBI 6:616; Kuekenth. 116.f. 14 A-E.

Perennial, glabrous, 30–90 cm tall herbs. Leaves 20–45 cm long, linear, glabrous. Inflorescence terminal, lax compound umbel. Spikelets linear-lanceolate or ovate-lanceolate, brownish-yellow, much compressed. Nut obovate or obovate-oblong, triquetrous.

North Gujarat (Talod), central Gujarat (Harni near Baroda) and south Gujarat (Surat); rare.

FLS & FRS : Aug.–Oct.

Cyperus exaltatus Retz. var. **dives** Cl. in Journ. Linn. Soc. 21:187. 1884; FBI 6:617; C 3:386. *Cyperus dives* Del. Fl. Aegpt. Ill. 5. t. 4. f. 3. 1813; Kuekenth. 68.

This variety is listed by Blatt. & McCann (*Journ. Bombay nat. Hist. Soc.* 37:276. 1934–1935) from central Gujarat (Godhra and Dakor).

Cyperus exaltatus Retz. var. **exaltatus** *Cyperus exaltatus* Retz. Obs. 5:11. 1789; FBI 6:617; C 3:386; Kuekenth. 64. f. 9 A–F; S & J 51.

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Perennial, stout, 40–125 cm tall, glabrous herbs. Leaves 20–100 cm long, linear, glabrous, serrulate on margins. Inflorescence terminal, compound or decompound umbel of spikes. Spikelets yellowish–to golden-brown, narrowly linear-lanceolate, elliptic–lanceolate or oblong-lanceolate. Nuts broadly ovate or ellipsoid-oblong, trigonous.

Throughout; common.

FLS & FRS : Sept.–Dec.

Cyperus flabelliformis Rottb. Descr. Icon. 42. t. 12. f. 2. 1773. *Cyperus alternifolius* L. var. *flabelliformis* (Rottb.) Kuekenth. in Engler, Pfreich. 101:193. 1936.

Perennial, rhizomatous, tufted, glabrous, 90–115 cm tall herbs. Leaves well developed, glabrous, linear, or reduced to sheaths. Inflorescence compound umbel, terminal. Spikelets yellowish –brown or straw–coloured, ovate–lanceolate or ellipsoid. Nuts slightly trigonous, ellipsoid or obovate, minutely transversely punctate.

Ornamental.

FLS & FRS : Throughout the year.

Cyperus flavescens L. Sp. Pl. 68. 1753; Kuekenth. 398; S 299. *Pycreus flavescens* Reichb. Fl. Germ. Exc. 72. 1830; FBI 6:589.

Annual, 20-35 cm tall herbs. Leaves 10-25 cm long, linear, glabrous. Inflorescence simple or compound umbel. Spikelets broadly ovate–oblong, yellowish–brown. Nuts biconvex, brown, transversely lineolate.

North Gujarat (Pahada); very rare.

FLS & FRS : Oct.

Cyperus flavidus Retz. var. **flavidus**. *Cyperus flavidus* Retz. Obs. 5:13. 1789 (non Cl. 1883 & 1893). *Cyperus globosus* auct. non Forsk.; C 3:370; Kuekenth. 352; S & J 51. *Pycreus capillaris* Nees in Linnaea 9:283. 1834; FBI 6:591.

Caespitose, glabrous herbs. Leaves 20–35 cm long, linear, glabrous. Inflorescence a simple umbel of contracted heads, head sometimes solitary. Spikelets 0.8–1.3 cm long, linear–oblong or oblong–lanceolate, compressed. Nut laterally compressed, biconvex, obovate or obovate–oblong, dark–brown or brownish–black, punctate.

Throughout; rare.

FLS & FRS : July–Dec.

Cyperus flavidus Retz. var. **strictus** (Lam.) Korlahalli in Bull. bot. Surv. Ind. 9:235–239. 1964. *Cyperus strictus* Lam. Tab. Encycl. 1:146. 1791; Roxb. Fl. Ind. 1:200. 1832; *Pycreus capillaris* Nees var. *stricta* Cl. in Hk. f. FBI 6:592. 1893.

Very closely allied to var. *flavidus* but differs in following characters. Spikelets 12–15, 0.7–1.1 cm long, straw–coloured or pale–yellow, laterally convex, straight, curved or twisted, each spikelet 6–14–flowered.

Rajpipla (Gora) and Broach, along banks of river Narmada; very rare.

FLS & FRS : Nov.–Apr.

Cyperus haspan L. Sp. Pl. 45. 1753; FBI 6:600; C 3:376; Kuekenth. 247.

Perennial, solitary or tufted, glabrous herbs. Leaves 5–10 cm long, linear. Umbel of 4–6, stellately arranged spikelets. Spikelets 1–2.5 cm long, linear to oblong–lanceolate. Nut broadly obovate or nearly trigonous, pale–brown, minutely warty.

Throughout, among grasses; rare.

FLS & FRS : Oct.–Nov.

Cyperus hyalinus Vahl, Enum. 2:329. 1806; C 3:369; Kuekenth. 498. *Pycreus pumilus* Nees in Linnaea 9:283. 1835; FBI 6:591 non *C. pumilus* L. *Pycreus hyalinus* Dunn. Bibl. Bot. 85:417. 1915.

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Glabrous, 5–10 cm tall herbs. Leaves 3–5 cm long, linear. Inflorescence terminal umbel. Spikelets oblong or broadly ovate-lanceolate, compressed. Nut nearly orbicular, biconvex, transversely punctate.

North Gujarat (Idar) and south Gujarat (Nargol); very rare.

FLS & FRS : Aug.–Nov.

Cyperus iria L. var. **iria.** *Cyperus iria* L. Sp. Pl. 45. 1753; FBI 6:606; C 3:380; Kuekenth. 150; S & J 51; S 299.

10–90 cm tall, glabrous herbs. Leaves as long as or shorter than stem, linear, glabrous. Inflorescence terminal, simple or compound umbel. Spikelets greenish-yellow to golden-brown, compressed, linear-oblong or ovate-lanceolate. Nut obtusely trigonous, obovoid-oblong or ellipsoid-obovate, microscopically transversely punctate.

Throughout, everywhere in moist ground; common, gregarious.

FLS & FRS : Throughout the year.

Cyperus iria L. var. **paniciformis** (Franch. et Sav.) Cl. in Hk. f. FBI 6:607. 1893. *Cyperus paniciformis* Franch. et Sav. Enum. Pl. Japan. 537. 1879. *Cyperus parviflorus* Nees in Wt. Contrib. 87. 1834 (non Vahl). *Cyperus iria* L. var. *parviflorus* (Nees) Miq. Fl. Ind. Bat. 3:270. 1859; S 299.

Similar to *C. iria* L. var. *iria* but the main difference is the long drawn out linear, raceme-like spikes, each of 10–25 spikelets; spikelets 2-flowered.

Throughout except Saurashtra and Kutch; rather not frequent.

FLS & FRS : Aug.–Oct.

Cyperus kyllingia Endl. Cat. Hort. Vindob. 1:94. 1842; Kuekenth. 606. f. 64 C–D; S 299. *Kyllinga monocephala* Rottb. Descr. & Icon. 13. t. 4. f. 4. 1773; FBI 6:588; C 3:390.

Perennial herbs, rhizomatous, slender, glabrous, 10–20 cm tall. Leaves 5–10 cm long, linear, glabrous. Inflorescence terminal, globose or ovoid-oblong head, of yellowish-green spikelets. Nuts obovate-oblong, compressed, minutely punctate.

Daugs (Chandkhed).

FLS & FRS : Oct.

Cyperus laevigatus L. Mant. Alt. 179. 1771; C 3:373; Kuekenth. 321; S & J 51. *Juncellus laevigatus* Cl. in Hk. f. FBI 6:596. 1893.

Perennial, solitary or tufted, slender, rhizomatous herbs. Leaves 0 or when present small, narrowly linear, flat, coriaceous. Spikelets 1.5–2 cm long, ovate, subcompressed or terete. Nuts obovate-oblong or ellipsoid, microscopically punctate.

Throughout, often along river banks; common in areas of occurrence.

FLS & FRS : Aug.–Jan.

Cyperus leucocephalus Retz. Obs. 5:11. 1789; FBI 6:602; C 3:377; Kuekenth. 278. f. 31 A–B; S 299.

Perennial, rhizomatous, slender, glabrous, 10–30 cm tall herbs. Leaves 5–17 cm long, narrowly linear, filiform, glabrous. Spikelets compressed, elliptic, in terminal, capitate head. Nut apiculate, trigonous, brownish to black.

North Gujarat and central Gujarat; very rare, among grasses.

FLS & FRS : Aug.–Oct.

Cyperus malabaricus (Cl.) Cooke, Fl. Pres. Bombay 2:856. 1908 & 3:369. 1958 (reprinted); Kuekenth. 390; S 299. *Pycreus malabaricus* Cl. in Journ. Linn. Soc. 34:12. 1898.

Annual, slender, glabrous, 9–25 cm tall herbs. Leaves 10–22 cm long, linear, glabrous. Spikelets 0.8–1 cm long, linear-oblong

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or ovate-lanceolate, 6–12, in terminal, digitate heads at ends of 3–6 umbellate rays or reduced to a single head. Nuts transversely lineolate.

Dangs, among grasses; not common.

FLS & FRS : Aug.–Nov.

Cyperus macer Cl. in Journ. Linn. Soc. 21:160. 1884; FBI 6:613; Kuekenth 83.

Reported by Blatter & McCann (*Journ. Bombay nat. Hist. Soc.* 37:272. Pl. III (1). 1934–1935) from Gujarat-Gorair-bridge, Chitrasani to Sarotra in sandy river bed of a stream at water edge.

Cyperus metzii (Hochst. ex Steud.) Matt. f. & Kuekenth. Engler, in Pfreich. 101:612. f. 64 J–K. 1936. *Kyllinga metzii* Hochst. ex Steud. Syn. Cyper. 70. 1855. *Kyllinga squamulata* Thonn. ex Vahl, Enum. 2:381. 1806; FBI 6:589. *Cyperus squamulatus* (Vahl) Suring. Het. Gesl. Cyp. 46. t. 2. f. 2. 1898 (non Steud.1855).

Annual, tufted, slender, 7–20 cm tall herbs. Laeves 5–12 cm long, linear, glabrous. Spikelets 0.4–0.5 cm long, broadly ovate, compressed, in globose or subglobose, terminal heads. Nuts broadly ovate-oblong, dull-brown, microscopically punctate.

North Gujarat (Balaram) and south Gujarat (Dangs); very rare.

FLS & FRS : Aug.–Sept.

Cyperus michelianus (L.) Link subsp. **pygmaeus** (Rottb.) Aschers. & Graebn. Syn. 2(2):273. 1930; Kuekenth. 312. f. 35 F-G. *Cyperus pygmaeus* Rottb. Descr. & Icon. 20. t. 14. ff. 4–5. 1773; C 3:373; S & J 41. *Juncellus pygmaeus* (Rottb.) Cl. in Hk. f. FBI 6:596. 1893.

Tufted, 4-20 cm tall herbs. Leaves 2–11 cm long, narrowly linear, glabrous. Spikelets 0.6-1 cm long, ovate, glaucous-green to yellowish-brown, in terminal, globose or ovoid-oblong heads.

Nuts ellipsoid-oblong, plano-convex or trigonous, pale-yellowish-brown, microscopically punctate.

Throughout, in drying moist ground and cultivated fields, seldom on sands.

FLS & FRS : Oct.–May

Cyperus niveus Retz. Obs. Fasc. 5:12. 1789; FBI 6:601; C 3:377; Kuekenth. 288.

Perennial, tufted, 40-65 cm tall, rhizomatous herbs. Leaves 20–55 cm long, linear, glabrous. Spikelets 1.3–2.3 cm long, pale-yellow, straw-coloured or nearly white, elliptic or ovate-oblong, much-compressed, in terminal, capitate heads. Nuts triquetrous, transversely punctate.

Throughout, occasional in the areas of occurrence.

FLS & FRS : Apr.–Aug.

Cyperus nutans Vahl var. **eleusinoides** (Kunth) Haines, Bot. Bihar & Orissa 898. 1924 & 941. 1961 reprinted. *Cyperus eleusinoides* Kunth, Enum. 2:39. 1837; FBI 6:608; C 3:382; Kuekenth. 144; S & J 51; S 298.

Perennial, tufted, 30–100 cm tall herbs. Leaves 20–80 cm long, linear, glabrous. Spikelets linear-oblong, ovate-oblong or ovate-lanceolate, reddish-brown, in terminal, lax, compound umbel. Nuts obovoid-oblong, trigonous, apiculate, microscopically transversely punctate.

Throughout.

FLS & FRS : July–Dec.

Cyperus nutans Vahl var. **nutans.** *Cyperus nutans* Vahl, Enum. 2:363. 1806; FBI 6:607; C 3:381; Kuekenth. 144. f. 5 A–D.

Perennial, tufted, 20-100 cm tall herbs. Leaves 50–70 cm long, linear, glabrous. Spikelets 1–2.5 cm long, linear, reddish- to dark-brown, spicately arranged into simple or compound umbels. Nut obovoid-oblong, trigonous, brownish-black, apiculate, punctate.

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Throughout (except Kutch); occasional to rare.

FLS & FRS : Sep.–Feb.

Cyperus pachyrhizus Nees ex Boeck. in Linnaea 35:545. 1868; FBI 6:603; S & J 51. *Cyperus conglomeratus* Rottb. var. *pachyrhizus* Trim. ex Hk. f. in Trim. Fl. Ceylon 5:23. 1900; C 3:379.

Perennial, densely tufted, 5–11 cm tall, rhizomatous herbs. Leaves 5–12 cm long, glabrous. Spikelets 0.8–1 cm long, broadly ovate to ovate-lanceolate. Nut as in *C. conglomeratus* Rottb.

Saurashtra, on sandy shores.

FLS & FRS : Aug.–May

Cyperus pangorei Rottb. Descr. et Icon. t. 7. f. 3. 1773; S & J 51; S 300. *Cyperus tegetum* Roxb. Fl. Ind. 1:208. 1832; FBI 6:613; C 3:384. *Cyperus corymbosus* Rottb. var. *pangorei* (Rottb.) Kuekenth. in Engler, Pfreich. 101:80. 1936.

15–120 cm tall, perennial herbs. Leaves 0, if present 10–17 cm long, linear, glabrous. Spikelets 1–2.5 cm long, linear, dark-brown or reddish-brown, in terminal, compound umbel. Nut chestnut-brown to black, obovoid-oblong, trigonous, punctate.

Throughout (except Kutch), often subgregarious; common.

FLS & FRS : Sep.–Jan.

Cyperus paniceus (Rottb.) Boeck. in Linnaea 36:381. 1870 (p. p.); Kuekenth. 526. *Kyllinga panicea* Rottb. Descr. et Icon. 15. t. 4. f. 1. 1773. *Mariscus paniceus* Vahl, Enum. Pl. 2:373. 1806 (p. p.); FBI 6:620.

Perennial, 30–45 cm tall herbs. Leaves 10–35 cm long, coriaceous, glabrous but for scabrid margins. Spikelets 0.4–0.5 cm long, lanceolate or ovate-lanceolate, in umbellately arranged, 1–2.5 cm long spikes. Nut fusiform or lanceolate, trigonous, punctate.

Panchmahals (Kel-Dezar); very rare.

FLS & FRS : Nov.

Cyperus papyrus L. Sp. Pl. 47. 1753; Kuekenth.45.

Perennials. Leaves reduced to sheaths. Spikelets 0.4–0.5 cm long, linear, straw-coloured, in terminal umbels. Nut not developed in the specimen examined.

North Gujarat (Taranga; Shah G. K. 1963).

Cyperus polystachyos Rottb. var. **polystachyos**. *Cyperus polystachyos* Rottb. Descr. et Icon. 39. t. 11. f. 1. 1773; Kuekenth. 367. *Pycreus polystachyos* Beauv. F. D'Oware 2:48. t. 86. f. 2. 1807.

Perennials, tufted, rhizomatous, 9–15 cm tall. Leaves 8–10 cm long, linear-lanceolate. Spikelets 0.7–1 cm long, linear-lanceolate or oblong-obovate, in terminal, compact, globose, 2–3-lobed head. Nut brownish-black, smooth.

Kutch, Baroda and Surat.

FLS & FRS : Dec.

Cyperus polystachyos Rottb. var. **laxiflorus** Bth. Fl. Austr. 7:261. 1878; Kuekenth. 370. *Pycreus polystachyos* Beauv. var. *laxiflorus* (Bth.) Cl. in Hk. f. in FBI 6:592. 1893. *C. odoratus* L. Sp. Pl. 46. 1753 (p. p.); C 3:372.

Stem 30–40 cm tall. Spikelets 2–2.5 cm long, chestnut-brown, 4–6, digitately arranged, in terminal, lax umbel. Nut as in *C. polystachyos* Rottb. var. *polystachyos*.

Baroda.

FLS & FRS : Dec.

Cyperus procerus Rottb. Descr. et Icon. 29. t. 5. f. 3. 1773; FBI 6:610; C 3:381; Kuekenth. 91.

Perennial, 30–65 cm tall herbs. Leaves few, 25–70 cm long, lanceolate, glabrous. Spikelets 1–1.5 cm long, ovate-oblong or oblong-lanceolate greyish-brown to dark-brown, in terminal, compound umbels. Nut oblong-obovate, dark-brown, transversely

ctate

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North Gujarat (Nalsarovar); rare.

FLS & FRS : Jan.

Cyperus pseudokyllingioides Kuekenth. in Engler, Pfreich. 101:501. 1936. *Courtoisia cyperoides* Nees in Linnaea 9:286. 1834 & in Wt. Contrib. Ind. Bot. 92. 1834; FBI 6:625; C 3:391 (non *Scirpus cyperoides* L.)

Annual, tufted, 6–30 cm tall herbs. Leaves 10-20 cm long, narrowly linear, glabrous. Spikelets 0.3–0.35 cm long, oblong-lanceolate, in simple or compound umbels of globose heads. Nuts oblong-lanceolate, trigonous, chestnut-brown or reddish-brown, warty.

In central and south Gujarat; not common.

FLS & FRS : Aug.–Dec.

Cyperus pumilus L. var. **membranaceus** (Vahl) Kuekenth. in Engler, Pfreich. 101:376. 1936; Kern in Reinwardt. 3:54. 1954. *Cyperus membranaceus* Vahl, Enum. 2:330. 1806. *Cyperus pumilus* L. forma *membranacea* (Vahl) Cl. in Journ. Linn. Soc. 21:44. 1846; S 300.

Reported from grasses at Tuwa by Deshpande (1968); rare.

FLS & FRS : Oct.

Cyperus pumilus L. var. **pumilus**. *Cyperus pumilus* L. Cent. Pl. 2:6. 1756 & Amoen. Acad. 4:302. 1786; C 3:370; Kuekenth. 375. f. 44 A–E. *Pycreus pumilus* Dom. in Bibl. Bot. 85:417. 1916; *Pycreus nitens* Nees in Nov. Act. Acad. Curr. 19. Suppl. 53. 1843; FBI 6:591.

Annual, tufted herbs. Leaves 3–17 cm long, glabrous, narrowly linear. Spikelets linear-oblong or oblong-obovate, much compressed, in terminal umbels or rarely a solitary head. Nut dark-brown or reddish-brown, laterally compressed, biconvex, punctate.

Throughout; common among grasses.

FLS & FRS : July–Oct.

Cyperus rotundus L. subsp. **rotundus**. *Cyperus rotundus* L. Sp. Pl. 45. 1753; FBI 6:614; C 3:385; S & J 51; S 300.

Perennial, 30-80 cm tall herbs. Leaves 5–10 cm long, linear, glabrous. Spikelets linear-cylindric or linear-lanceolate, compressed. Nuts triquetrous, oblong or obovate-oblong, smooth, dark-brown or blackish-brown, punctate.

Throughout, common everywhere. (CHIDO)

FLS & FRS : Throughout the year.

Cyperus rotundus L. subsp. **tuberosus** (Rottb.) Kuekenth. in Engler, Pfreich. 101:113. 1936. *Cyperus tuberosus* Rottb. Descr. et Icon. 28. t. 7. f. 1. 1773; FBI 6:616 (p. p.); C 3:385.

Perennial herbs. Leaves 17–30 cm long, glabrous, linear. Spikelets 1–1.5 cm long. Nuts obovate-oblong, obtusely trigonous.

South Gujarat (Broach), rare; also in central Gujarat.

FLS & FRS : Dec.

Cyperus sanguinolentus Vahl subsp. **sanguinolentus**. *Cyperus sanguinolentus* Vahl, Enum. Pl. 2:351. 1806; C 3:359. *Pycreus sanguinolentus* (Vahl) Nees in Linnaea 9:283. 1835; FBI 6:590.

Perennial, tufted, herbs. Leaves 8–12 cm long, linear, glabrous. Spikelets 3-5, digitately arranged, on each ray of terminal, simple umbel. Nuts globose-ovoid or nearly orbicular, biconvex, transversely lineolate, yellowish-brown.

North Gujarat (river Banas) and south Gujarat (Dangs).

FLS & FRS : Sept.

Cyperus scariosus R. Br. Prodr. Fl. Pl. Holl. 216. 1810; FBI 6:612. *Cyperus corymbosus* Rottb. var. *scariosus* (R. Br.) Kuekenth. in Engler, Pfreich. 101:83. 1936.

Included on the authority of Thaker J. I. (1910, p. 708 & 1926, p. 27) who listed it from Kutch and Saurashtra.

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Cyperus squarrosus L. Cent. Pl. 2:6. 1756; Kuekenth. 505; S & J 51. *Cyperus aristatus* Rottb. Progr. 22. 1772 & Descr. et Icon. 23. t. 6. f. a. 1773; FBI 6:606; C 3:380.

Caespitose, glabrous herbs, 7–18 cm tall. Leaves 4–10 cm long, narrowly linear to ensiform, glabrous. Spikelets linear-oblong, in compact spikes forming a simple umbel and often with a sessile one at base of an umbel. Nuts dark-brownish-black, obovoid-oblong, trigonous, microscopically punctate.

Throughout among grasses; common.

FLS & FRS : Aug.–Jan.

Cyperus stoloniferus Retz. Obs. 4:10. 1786; FBI 6:615; Kuekenth. 106; S & J 51.

Perennial, herbs, with stolons bearing tubers. Leaves 5–11 cm long, linear. Spikelets 1.5–2 cm long, ovate-lanceolate to oblong-lanceolate. Nuts obovate-oblong, plano-convex or obscurely trigonous, transversely lineolate.

Included on the authority of Thaker J. I. (1910, p. 708 & 1926, p. 277) from Saurashtra and Kutch; also reported from the latter locality by Blatter (1909, p. 162) also.

Cyperus tenuispica Steud. Synop. Cyper. 2:11. 1855; Kuekenth. 245. *Cyperus flavidus* auct. non Retz. 1789; FBI 6:600; C 3:375.

6–35 cm tall, erect or diffuse herbs. Leaves 5–20 cm long, linear to ensiform, glabrous. Spikelets 0.5–1 cm long, linear-lanceolate, compressed, pale- to dark-green or greenish-yellow, in terminal, compound umbels. Nuts globosely-obovoid, trigonous, vertically verrucose.

Throughout (except Kutch and Saurashtra), a weed in cultivated fields and drying moist ground; frequent in areas of occurrence.

FLS & FRS : Oct.–Dec.

Cyperus triceps (Rottb.) Endl. Cat. Hort. Vinodb. 1:94. 1842; Kuekenth. 578; S & J 51; S 301. *Kyllinga triceps* Rottb. Descr. et Icon. 14. t. 4.f. 6. 1773; FBI 6:587; C 3:391.

Perennial, slender, tufted, 17–50 cm tall herbs. Leaves 7–19 cm long, narrowly linear. Spikelets numerous, greenish-white or dirty-white, in terminal, 2–4-lobed or rarely unlobed head. Nuts oblong or ellipsoid, biconvex.

Throughout among grasses; common.

FLS & FRS : Aug.–Jan.

ELEOCHARIS R. Br.

Key to species

1. Perennials :
   2. Glumes subrigid, smooth or striate, but not keeled, concolorous; stem usually stout; spikelets cylindric; nut vertically striate :
      3. Stem terete, when dry transversely septate....*E. dulcis*
      3. Stem triquetrous, when dry not septate....*E. acutangula*
   2. Glumes membranous with a green keel; stem slender; nut smooth.. .. ..*E palustris*

1. Annuals :
   4. Style bifid :
      5. Hypogynous bristles glistening white; nut without faint vertical lines.. .. ..*E. atropurpurea*
      5. Hypogynous bristles brown; nut with faint vertical lines.. .. ..*E. geniculata*
   4. Style 3-fid; nut trigonous... .. .. ..*E. congesta*

Eleocharis acutangula (Roxb.) Schult. in R. & S. Mant. 2:91. 1824; Kern in Reinwardt. 6(1):35. 1961. *Scirpus fistulosus* Poir. Encycl. 6:749. 1804 (non Forsk. 1775). *Scirpus acutangulus* Roxb. Fl. Ind. 1:216. 1820. *Eleocharis fistulosa* Link ex Spr. Jahrb. 3:78. 1820; FBI 6:626; C 3:402.

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Tufted, aquatic, partly submerged, rhizomatous herbs, 30–60 cm tall. Leaves reduced to sheaths. Spikelet 2–3 cm long, terete, terminal. Hypogynous bristles 6, retrorsely scabrid. Nuts creamy-white, obovate-oblong, vertically striate.

Central Gujarat (*Sabnis* no. 79) and south Gujarat (Surat, *Shah* without number); very rare.

Eleocharis atropurpurea Kunth, Enum. 2:151. 1837; FBI 6:627; C 3:403; S & J 51; S 302.

Tufted, 20–25 cm tall herbs. Leaves 0. Spikelet solitary, terminal, globose or ovoid, brownish-green to yellowish-brown. Hypogynous bristles 4–7, retrorsely scabrid. Nuts dark-brown, to almost black, obovate-oblong, smooth, biconvex to plano-convex, polished.

Throughout; common.

FLS & FRS : Sep.–Dec.

Eleocharis congesta D. Don, Prodr. Fl. Nepal. 41. 1825; FBI 6:630; Shah et al. in Ind. For. 100:121–122. 1974.

Tufted, 4–15 cm tall, glabrous herbs. Leaves 0. Spikelet solitary, terminal, straw-coloured or yellowish-brown, ovate-oblong, cylindric or elliptic. Hypogynous bristles 6, retrorsely scabrid.

Saurashtra (Barda hill, Junagadh); very rare.

FLS & FRS : Nov.–Apr.

Eleocharis dulcis (Burm. f.) Henschel. Vita. Rumph. 186. 1833. Kern in. Reinwardt. 6(1):36. 1961. *Andropogon dulce* Burm. f. Fl. Ind. 219. 1768. *Scirpus plantagineus* Retz. Obs. 5:14. 1789. *Eleocharis plantaginea* (Retz.) R. Br. Prodr. 224. 1810; FBI 6:625; C 3:402.

Tufted, partly sumbmerged herbs, 10–60 cm tall; stolons 4–5 cm long. Leaves 0. Spikelet solitary, terminal, cylindric, straw-coloured or tinged reddish-brown. Hypogynous bristles 7,

scabrid, pale-yellow or creamy-white. Nut broadly obovoid or orbicular-obovate, biconvex, smooth, compressed, creamy-white.

North to south Gujarat in plains in water-logged soil, gregarious; abundant in areas of occurrence.

FLS & FRS : Throughot the year.

Eleocharis geniculata (L.) R. & S. Syst. Veg. 2:150. 1817; S & J 51. *Scirpus geniculatus* L. Sp. Pl. 48. 1753. *Eleocharis capitata* R. Br Prodr. 225. 1810; FBI 6:627; C 3:404.

Tufted herbs, very rarely with a small rhizome. Leaves 0. Spikelet solitary, terminal, ovate-oblong or slightly conical, greenish-yellow or brown. Hypogynous bristles 6–7 (–8), yellowish-brown, retrorsely scabrid. Nut obovoid-oblong or nearly globose, biconvex, dark-brown to nearly black, smooth.

Throughout, in plains; not common.

FLS & FRS : Oct.–Jan.

Eleocharis palustris (L.) R. & S. Syst. Veg. 3:151. 1817; FBI 6:628; C 3:404; *Scirpus palustris* L. Sp. Pl. 47. 1753.

Tufted, stoloniferous herbs. Leaves 0. Spikelet solitary, terminal, cylindric or ellipsoid, chestnut-brown or straw-coloured. Hypogynous bristles 4, retrosely or antrosely scabrid. Nut orbicular-obovoid, biconvex, compressed, creamy-white, smooth.

North Gujarat (Himatnagar and Bhadreshwar); very rare.

FLS & FRS : Jan.

ERIOPHORUM L.

Eriophorum comosum Wall. ex Neess in Wt. Contrib. 110. 1834; FBI 6:664; C 3:411; S & J 51.

Perennial, tufted, slender herbs, with woody rhizome. Leaves longer than stem, narrowly linear, serrulate on margins. Spikelets ellipsoid-oblong or ovate-oblong, reddish-brown, in

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terminal, decompound umbels. Hypogynous bristles numerous, longer than nut. Nut trigonous, greyish-black, vertically lineolate.

Saurashtra (Junagadh, Girnar), north Gujarat (Sarneshwar), central Gujarat (Pavagadh), and south Gujarat (Gora); abundant in areas of occurrence; on rock cuttings, river slopes etc. *FLS & FRS* : Sep.-Dec.

FIMBRISTYLIS Vahl

Key to species and varieties

1. All glumes spirally imbricating :
   2. Stigmas 2; nut biconvex :
      3. Spikelet only one or few (2–6) in the umbel :
         4. Spikelet solitary; leaves 0 or very short; stem obscurely 4-angled; nut stipitate, linear-oblong or subcylindric, curved.. .. .. .. *F. tetragona*
         4. Spikelets 1–3, (rarely upto 6); stem not 4-gonous; leafy; nut turbinate :
            5. Nut sessile, yellow, dotted with white spots .. .. *F. polythricioides*
            5. Nut stipitate, snow-white with a brown patch on each face.. .. .. .. *F. schoenoides*
      3. Spikelets many, umbellate, rarely capitate (Spikelets few in *F. ferruginea*) :
         6. Nut prominently striate with 6–8 vertical trabeculate ribs :
            7. Annuals; glumes one-nerved, obtuse; nuts 0.1–0.15 cm long.. .. .. .. *F. bisumbellata*
            7. Perennials; glumes 3-nerved, mucronate, nuts 0.06–0.08 cm long.. .. .. *F. dichotoma* var. *dichotoma*
         6. Nut faintly striate with many vertical, trabeculate ribs :
            8. Glumes cymbiform, much convex on back, shining brown; stem slender; nut not verrucose .. .. *F. alboviridis*

            8. Glumes more or less flat, rusty-brown; stem stout; superficial cells arranged in many faint vertical lines, very distantly verrucose in the upper half .. .. .. *F. dichotoma* var. *pluristriata*
         6. Nut smooth or very faintly ribbed (slightly tubercled on faces in *F. argentea*; seldom transversely lineolate) :
            9. Leaves absent or if present, very short.. .. .. *F. ferruginea*
            9. Stem leafy; leaves well developed :
               10. Spikelets in a capitate head.. .. *F. argentea*
               10. Spikelets umbellate :
                  11. Perennials; nut not transversely lineolate :
                     12. Leaves as long as stem; nut distinctly stipitate; glumes densely pubescent.. .. .. *F. sieberiana*
                     12. Leaves much shorter than stem, crowded at base, recurved; nut sessile; glumes glabrous.. *F. cymosa*
                  11. Annuals; nut faintly transversely lineolate.. .. .. .. *F. aestivalis*
   2. Stigmas 3; nut trigonous :
      13. Stem upto 20 cm long :
         14. Inflorescence a head of digitately spreading, 3–7 spikelets; stamens 3; nut globosely obovoid .. .. *F. lawiana*
         14. Inflorescence not as above; stamen 1; nut narrowly obovoid .. .. .. *F. woodrowii*
      13. Stem more than 20 cm long :
         15. Spikelets obtuse; glumes not mucronate; style glabrous; rachilla not winged.. .. *F. littoralis*
         15. Spikelets acute; glumes mucronate; style hairy; rachilla winged.. .. .. .. *F. miliacea*
1. All glumes or atleast lower ones distichous or subdistichous :

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16. Spikelet solitary.. .. ..*F. ovata*

16. Spikelets many, in simple or compound umbels :

17. Leaves filiform.. .. ..*F. tenera*

17. Leaves flat, not as above :

18. Style glabrous; spikelets not in sessile clusters :

19. Stem flattened, near top two edged.. .. ..*F. complanata*

19. Stem not flattened under the umbel.. .. ..*F. microcarya*

18. Style pubescent; spikelets in sessile clusters.. .. ..*F. falcata*

Fimbristylis aestivalis (Retz.) Vahl, Enum. 2:288. 1806; FBI 6:637; C 3:395; S 301. *Scirpus aestivalis* Retz. Obs. 4:12. 1786.

Densely tufted, 8–30 cm tall herbs. Leaves 6–30 cm long, very narrowly linear, pubescent. Spikelets elliptic-oblong or ovate-oblong, in terminal, decompound umbels. Nut orbicular-obovoid or obovate-oblong, creamy-yellow, much compressed, biconvex.

Central and south Gujarat, among moist grasses; not common.

FLS & FRS : Sep.–Jan.

Fimbristylis alboviridis Cl. in Hk. f. FBI 6:638. 1893 & in Journ. Linn. Soc. 34:60. 1898. *Fimbristylis annua* R. & S. var. *pluristriata* Backer in Bekn. Fl. Java (em. ed.) 10.1949. fam. 246. p. 21 (non *F. diphylla* Vahl var. *pluristriata* Cl. 1893.).

Annual, tufted, 10–40 cm tall, caespitose, filiform herbs. Leaves 3–15 cm long, very narrowly linear, serrulate on margins near apex. Spikelets oblong, chestnut –to reddish-brown, ovate to oblong, in terminal, compound umbel. Nut obovate-oblong or ellipsoid, biconvex, creamy–white or pale–yellow.

Central (Lunawada) and south Gujarat (Dediapada, Dangs); rare.

Fimbristylis argentea (Rottb.) Vahl, Enum. 2:294. 1806; FBI 6:640; C 3:395. *Scirpus argenteus* Rottb. Descr. et Icon. 51. t. 17. f. 6. 1773.

Annual herbs, tufted, caespitose, glabrous, 5–10 cm tall. Leaves shorter than stem, very narrowly linear, glabrous. Spikelets 7-10, in terminal, capitate head. Nut nearly orbicular or broadly obovoid-oblong, biconvex, compressed, creamy-white or straw-coloured, shortly stipitate.

Saurashtra (Rajkot), north Gujarat (Sonasan) and central Gujarat (Tuwa); very rare.

FLS & FRS : Sep.–Oct.

Fimbristylis bisumbellata (Forsk.) Bub. Dodec. 30. 1850; S & J 51. *Scirpus bisumbellatus* Forsk. Fl. Aegpt.-Arab. 15. 1775. *Fimbristylis dichotoma* auct. non *Scirpus dichotoma* L. nec *F. dichotoma* Vahl; FBI 6:635; C 3:394.

Erect or radially spreading, 7–40 cm tall, caespitose, glabrous herbs. Leaves 5–30 cm long, very narrowly linear. Spikelets 0.4–0.5 cm long, ellipsoid-oblong or ovate-oblong, yellowish–to reddish-brown, in simple or compound umbels. Nut oblong-obovate, biconvex, creamy–yellow or straw–coloured.

Throughout, in moist ground; common.

FLS & FRS : July–Dec.

Fimbristylis complanata (Retz.) Link, Hort. Berol. Descr. 1:292. 1827; FBI 6:646; C 3:400. *Scirpus complanatus* Retz. Obs. 5:14. 1789.

Perennial, tufted, 30–40 cm tall, rhizomatous herbs. Leaves shorter than stem, linear, scabrid on margins. Spikelet 0.5–0.7 cm long, ovate–lanceolate or ovoid-oblong, reddish-brown, in compound or decompound umbels. Nuts obovoid, trigonous, tubercled, almost white or pale–straw, sessile or shortly stipitate.

Throughout (except Kutch), among grasses, with restricted distribution; not frequent.

FLS & FRS : Aug.–Dec.

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Fimbristylis cymosa R. Br. Prodr. 228. 1810; S & J 51. *Fimbristylis spathacea* Roth, Nov. Pl. Sp. 24. 1821; FBI 6:640; C 3:396.

Perennial, tufted, rhizomatous, caespitose, 10–35 cm tall herbs. Leaves 5–14 cm long, linear, glabrous, scabrulous on margins. Spikelets 0.5–1.2 cm long, ellipsoid or ovoid, pale-brown or greyish-yellow, terminal. Nut broadly obovate, substipitate, compressed, dark-reddish-brown to almost black.

Throughout; not frequent.

FLS & FRS : July–Mar.

Fimbristylis dichotoma (L.) Vahl var. **dichotoma**. *Fimbristylis dichotoma* (L.) Vahl, Enum. 2:287. 1805. *Scirpus dichotomus* L. Sp. Pl. 50. 1753. *Scirpus diphylla* Retz. Obs. 5:15. 1789. *Fimbristylis diphylla* (Retz.) Vahl, Enum. 2:289. 1806; FBI 6:636; C 3:396; S 301.

Perennial, tufted, erect or radially spreading herbs, 4–55 cm tall, rhizomatous. Leaves 3–12 cm long, linear to linear-lanceolate, minutely hairy, reflexed. Spikelets ellipsoid-oblong or ovoid-oblong, greenish-yellow to yellowish-brown, in terminal, compound umbels. Nut biconvex, pale-straw or white, sessile.

Throughout, everywhere; common, scattered or subgregarious.

FLS & FRS : Throughout the year in permanent moist ground.

Fimbristylis dichotoma (L.) Vahl var. **pluristriata** (Cl.) Napper in Kew Bull. 25(3):437. 1971. *Fimbristylis diphylla* (Retz.) Vahl var. *pluristriata* Cl. in Hk. f. FBI 6:637. 1893. *Fimbristylis podocarpa* Nees in Wt. Contrib. Bot. India 98. 1834; FBI 6:638. *Fimbristylis diphylla* Retz. var. *podocarpa* (Nees) Kuckenth. in Engl. Bot. Jahrb. 69:257. 1838.

Annual, tufted, caespitose, slender, 15–45 cm tall herbs. Leaves 5–30 cm long, linear, glabrous, scabrid on margins.

Spikelets reddish-brown, broadly ovate, ovate-lanceolate or ellipsoid-oblong, few, in simple umbels. Nut broadly obovate or obovoid, biconvex, compressed, pale-yellow to straw-coloured.

Dangs (Ahwa, Saputara), among grasses; not frequent.

FLS & FRS : Aug.–Sept.

Fimbristylis falcata (Vahl) Kunth, Enum. Pl. 2:239. 1837; Kern in Reinwardt. 6(1):39. 1961. *Scirpus falcatus* Vahl, Enum. 2:275. 1806. *Fimbristylis junciformis* Kunth, Enum. Pl. 2:239. 1837; FBI 6:647; C 3:400.

Perennial, solitary or sparsely tufted, 9–30 cm tall herbs, with horizontal or oblique rhizome. Leaves 3–7 cm long, crowded at base, narrowly linear, spreading or recurved, glabrous scabrid on margins. Spikelets ovate-oblong or ellipsoid-oblong, reddish-brown, solitary or 2–3 fascicled at tip of each ray. Nuts obovoid or obovate-oblong, almost sessile, pale-straw or nearly white, tubercled.

Throughout (except Kutch), in very few localities; not frequent; among grasses.

FLS & FRS : Aug.–Sept.

Fimbristylis ferruginea Vahl, Enum. 2:291. 1806; FBI 6:638; C 3:396; S & J 52; S 301.

Perennial, tufted, 10–40 cm tall, rhizomatous herbs. Spikelets ovate-lanceolate, reddish-brown, terminal. Nut orbicular, umbonate, very distinctly stipitate.

Throughout, but very much restricted in distribution, among grasses; not common.

FLS & FRS : Aug.–Oct.

Fimbristylis lawiana (Boeck.) Kern in Reinwardt. 4:96. 1956. *Scirpus lawianus* Boeck. in Linnaea 36:497. 1869–70. *Fimbristylis digitata* Boeck. in Flora 61:35. 1878; FBI 6:648; C 3:398; S 301.

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8-20 cm tall, tufted, rhizomatous herbs. Leaves few, 3-5.5 cm long, narrowly linear, scabrid on margins. Spikelets 0.7-0.8 cm long, ovate-oblong or ellipsoid, straw-coloured. Nut globosely obovoid, triquetrous, slightly apiculate, stipitate, pale-to creamy-yellow, faintly lineolate.

Dangs (Malegnon, Ahwa, Saputara) and near Baroda (Nimeta); locally frequent.

FLS & FRS : Aug.-Oct.

Fimbristylis littoralis Gaud. in Freyc. Voy. Bot. 413. 1826. *Fimbristylis miliacea* Sensu Bth. Fl. Austral. 316. 1878; FBI 6:644; C 3:397; S 302 (omne non Vahl).

Annual, tufted, (8–)20–45 cm tall herbs. Leaves 2-30 cm long, linear, scabrid on margins. Spikelets 0.2-0.3 cm long, globose or subcylindric, dark-reddish-brown, in terminal, compound umbels. Nut broadly obovoid, creamy-white, acutely trigonous, tubercled, transversely ribbed, minutely stipitate.

From north to south Gujarat with restricted distribution; fairly common in areas of occurrence.

FLS & FRS : Aug.-Nov.

Fimbristylis microcarya F. Muell. Fragm. Phyt. Austr. 1:200. 1858–59. *Fimbristylis complanata* Link var. *microcarya* (F. Muell.) Cl. in Hk. f. FBI 6:646. 1893; C 3:400.

F. microcarya F. Muell. differs from *F. complanata* Link, among other characters, in the stem which is not at all flattened below the umbel. It is included on the strength of the sole herbarium specimen (*Pataskar* 112196) at B. S. I. herbarium, Poona.

Rajpipla (Piplod).

FLS & FRS : Dec.

Fimbristylis miliacea (L.) Vahl, Enum. 2:287. 1806. *Scirpus miliaceus* L. Syst. (ed. 10) 868. 1756. *Scirpus quinquangularis* Vahl, Enum. 2:279. 1806. *Fimbristylis quinquangularis* (Vahl) Kunth, Enum. 2:229. 1837; FBI 6:644; C 3:397; S & J 52; S 302.

Annuals, tufted, 10-45 cm tall. Leaves 10-35 cm long, glabrous, narrowly linear, scabrid on margins. Spikelet ellipsoid-oblong or ovoid, pale-to dark-reddish-brown, in terminal, compound umbel. Nut obovoid-oblong or ellipsoid, trigonous, pale-brown or yellow, tuberculate, minutely stipitate.

Throughout, among grasses; common.

FLS & FRS : Aug.-Dec.

Fimbristylis ovata (Burm. f.) Kern in Blumea 15:126. 1967. *Carex ovata* Burm. f. Fl. Ind. 194. 1768. *Cyperus monostachyos* L. Mant. 2:180. 1771. *Fimbristylis monostachyos* Hassk. Fl. Java Rar. 61. 1848; FBI 6:649; C 3:399.

Perennial, tufted herbs, 8-30 cm tall, with a very small rhizome. Leaves 3–16 cm long, glabrous but for scabrid margins, narrowly linear. Spikelet terminal, 0.6–0.7×0.3–0.4 cm, pale-yellow or straw-coloured, ovate. Nut creamy-yellow or straw-coloured, pyriform, acutely trigonous, tubercled, stipitate.

Throughout (except Kutch) but very much restricted in distribution; not common.

FLS & FRS : Aug.-Oct.

Fimbristylis polythricioides Vahl, Enum. 2:248. 1806; FBI 6:632; C 3:393.

4–30 cm tall, rhizomatous herbs. Leaves 3–8 cm long, very narrowly linear, glabrous, crowded at base. Spikelet terminal, ovate-lanceolate to oblong-elliptic, pale-brown. Nut yellow with white spot, truncate or subtruncate at apex, much narrowed towards base, sessile, obovate, biconvex, faintly lineolate.

In restricted localities in south and central Gujarat, among grasses; rather rare.

FLS & FRS : Aug.-Oct.

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Fimbristylis schoenoides (Retz.) Vahl, Enum. 2:286. 1806; FBI 6:634; C 3:394; S & J 52; S 302. *Scirpus schoenoides* Retz. Obs. 5:14. 1789.

Annual, tufted herbs, 5–45 cm tall, very rarely with a small, woody rhizome. Leaves 9–30 cm long, linear, filiform, scabrid on margins. Spikelet 0.9–1.2 × 0.4–0.5 cm, broadly ovate–oblong or oblong-lanceolate, terminal. Nut orbicular-oblong, oblong-lanceolate or ellipsoidal, biconvex, umbonate.

Saurashtra and north and central Gujarat, among grasses; common.

FLS & FRS : Aug.–Oct.

Fimbristylis sieberiana Kunth, Enum. 2:237. 1837; Shah & Suryanarayana in Journ. Bombay nat. Hist. Soc. 66:412–414. 1969. *Fimbristylis ferruginea* Vahl var. *sieberiana* Boeck. in Linnaea 37:17. 1817.

10–50 cm tall herbs, with a small woody rhizome. Leaves flat, narrowly linear, scabrid on margins. Spikelets 0.8–1 × 0.3–0.4 cm, ferruginous-brown, ovate-oblong to lanceolate, in terminal, simple or subcompound umbels. Nut globose or obovate to oblong –obovate, broadly apiculate, yellowish-brown, biconvex, umbonate.

Throughout (except Saurashtra and Kutch at present); common.

FLS & FRS : Aug.–Oct.

Fimbristylis tenera R. & S. Syst. Veg. 2: (Mant.) 57. 1824; FBI 6:642; S 302. *Fimbristylis tenera* R. & S. var. *oxylepis* (Steud.) Cl. in Hk. f. FBI 6:642. 1893. *Fimbristylis monticola* Hochst. ex Steud. Syn. Pl. Cyp. 3:111. 1855; C 3:399.

Annuals, 6–25 cm tall. Leaves 5–12 cm long, linear, scabrid on margins. Spikelets 0.8–1 cm long, linear or ellipsoid-lanceolate, chestnut-brown, terminal. Nut creamy-white or pale-straw, obovoid, obtusely trigonous, prominently tuberculate, minutely stipitate.

Throughout with restricted localities of distribution; common in areas of its occurrence.

FLS & FRS : Aug.–Dec.

Fimbristylis tetragona R. Br. Prodr. 226. 1810; FBI 6:631; C 3:393. *Fimbristylis cylindrocarpa* Kunth, Enum. 2:222. 1837; Boeck. in Linnaea 37:7. 1871.

Perennial, caespitose herbs, 20–45 cm tall, with small rhizomes. Spikelet terminal, globose to broadly ovate, yellowish-brown or straw-coloured. Nut pale-yellow or straw-coloured, with 10-12 longitudinal trabeculae.

Kutch and south Gujarat (Bulsar, Surat and Dangs)

FLS & FRS : Aug.–Sep.

Fimbristylis woodrowii Cl. in Journ. Linn. Soc. 34:68. 1898; C 3:398; S 302.

6–15 cm tall, caespitose, slender or almost filiform herbs. Leaves 2–5 cm long, setaceous. Spikelets reddish-brown, linear-lanceolate to ovate-lanceolate, in terminal, simple to compound umbels. Nuts obovate-oblong or elliptic, trigonous, creamy-white, shortly stipitate, faintly few-ribbed.

Central Gujarat (Baroda, Tuwa) and south Gujart (Dangs).

FLS & FRS : Sep.–Oct.

FUIRENA

Key to species

1. Hypogynous scales and bristles absent.. .. ..*F. pubescens*
1. Hypogynous scales present, bristles absent.. ..*F. umbellata*

1. Hypogynous scales and bristles present :
   2. Hypogynous scales oblong, hastate at base, centrally thickened simulating 1-nerved, rounded or obtuse and somewhat thickened at apex.. .. .. ..*F. tuwensis*

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2. Hypogynous scales not as above :
   3. Claw of hypogynous scales shorter than blade; nut not with acute angles.. .. ..*F. uncinata*
   3. Claw of hypogynous scales as long as the blade; nut with acute angles.. .. ..*F. ciliaris*

Fuirena ciliaris (L.) Roxb. Fl. Ind. 1:184. 1820; Blatter in Journ. Bombay nat. Hist. Soc. 37:772. 1934. *Scirpus ciliaris* L. Mant. 2:182. 1771. *Fuirena glomerata* Lam. Tab. Encycl. Meth. 1:150. 1791; FBI 6:666; C 3:412.

Annual herbs, 12–30 cm tall. Leaves 2-19×0.4-0.6 cm, linear-lanceolate. Spikelets dark-green to greenish-black, broadly ovate to oblong-ovoid, many-flowered, in terminal heads of 4–8 spikelets. Nut obovate, stipitate, yellowish-brown, smooth.

North to south Gujarat, with restricted distribution.

FLS & FRS : Oct.-Jan.

Fuirena pubescens Kunth, Enum. 2:182. 1837; FBI 6:665; S & J 52.

Perennial, solitary, 6–20 cm tall herbs. Leaves 4–8.5 × 0.3-0.4 cm, linear-lanceolate, serrulate on margins. Spikelets in clusters 1-1.3 × 0.3–0.4 cm, oblong-lanceolate, many-flowered. Nut not mature in specimen examined.

Saurashtra (Rajkot *HS* 13528; Jamnagar *HS* 7613.)

FLS: Aug.

Fuirena umbellata Rottb. Descr. et Icon. 70. t. 19. f. 3. 1773; FBI 6:666; C 3:413; S & J 52.

Included on the authority of Santapau and Janardhanan (1967) from Saurashtra.

Fuirena uncinata Kunth, Enum 2:184. 1837; FBI 6:666; C 3:413; S & J 52.

Included on the authority of Santapau and Janardhanan (1967) from Saurashtra.

Fuirena tuwensis Deshpande et Shah in Bull. bot. Surv. India 10 (2) : 239. ff. 1–4. 1968.

Perennial, tufted herbs, 15-60 cm tall. Leaves 15-30 × 0.6–0.7 cm, lanceolate, pubescent. Spikelets ovate-oblong or ellipsoid-oblong, sessile, 3–4, at tips of simple or compound umbel rays. Nut acutely trigonous, smooth, margined, beaked.

Central Gujarat (Tuwa and Navagam in Panchmahals district).

FLS & FRS : Oct.-Dec.

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REMIREA Aubl.

Remirea maritima Aubl. Hist. Pl. Guian. 1:45. 1775; FBI 6:677; C 3.417.

Perennial herbs, 6–12 cm tall, rhizomatous. Leaves 2-6× 0.5–0.6c m, yellowish-green, falcately spreading, linear-lanceolate, coriaceous, with strong, scabrid keel and tough, cuspidate apex. Spikelets 0.4-0.42 cm long, ovate-oblong, in terminal, 1.5–2 cm across, globose heads. Nut linear-oblong, trigonous, greyish-brown to light-black, microscopically transversely punctate.

Reported by Shah C. K. (1963) from Memnagar and Sarkhej near Ahmedabad in north Gujarat.

RHYNCHOSPORA Vahl nom. cons.

Key to species

1. Inflorescence a capitate head; hypogynous bristles 6, retrosely scabrid; nut scabrulous; surface cells polygonal....*R. wightiana*
1. Inflorescence panicle; hypogynous bristles 4, antrorsely scabrid; nut not scabrulous; surface cells squarish or rectangular arranged in transverse wavy lines.. .. .. ..*R. glauca*

Rhynchospora glauca Vahl, Enum. 2:233. 1806; FBI 6:671. *Rhynchospora chinensis* Boeck. in Linnaea 37:586. 1873. *Rhynchospora glauca* Vahl var. *chinensis* Cl. in Hk. f. FBI 6:672. 1893.

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Small, tufted, 24–30 cm tall herbs. Leaves few, 5-9 cm long, linear, scabrid on margins and nerves. Spikelets 0.4–0.6 cm long, ovate-lanceolate or ellipsoid, dark-brown or reddish-brown, axillary. Nut stipitate, chestnut-brown, ovate-oblong, ovate-lanceolate or broadly conical.

South Gujarat (Surat), collected by J. V. Joshi from Variav island in the river Tapti.

FLS & FRS : Sep.

Rhynchospora wightiana (Nees) Steud. Cyper. 148. 1855; FBI 6:669; C 3:415. *Haplostylis wightiana* Nees in Nov. Act. Akad. Nat. Curr. 19 (Suppl. 1) : 101. 1843.

Solitary or tufted, 6-50 cm tall, caespitose herbs. Leaves 3–7 cm long, narrowly linear, glabrous. Spikelets 0.6–0.7 cm long, linear-lanceolate, smooth, shining, terminal. Nut linear-oblong, much compressed, beaked.

North Gujarat (Shamalaji) and south Gujarat (Dangs, Songadh, Bulsar); rare.

FLS & FRS : Aug.–Sep.

SCIRPUS L.

Key to species

1. Spikelets clustered on lateral or terminal heads (sometimes simple, lateral umbel) :
   2. Spikelet clusters lateral :
      3. Hypogynous bristles present, retrorsely scabrid :
         4. Stem slender, terete; style 2-fid; nut with transverse wavy lines.. .. ..*S. juncoides*
         4. Stem robust, trigonous; style 3-fid; nut vertically lineolate, with dark coloured patches..*S. triangulatus*
      3. Hypogynous bristles 0 :
         5. Nut transversely rugose; inflorescence lateral; glumes not aristate :
            6. Stem flowering in the lower half, septate when dry; glumes not or scarcely keeled, not mucronate ;

            7. Stem robust, 0.5–0.7 cm broad when pressed; sheath lax; glumes broadly ovate..*S. articulatus*
            7. Stem slender, 0.1–0.2 cm broad, when pressed; sheath tight; glume suborbicular....*S. jacobi*
         6. Stem flowering in the upper half, not septate (exception *S. roylei*); glumes mucronate, keeled :
            8. Glumes multistriate, lax, inflated in fruit; stem septate when dry.. .. ..*S. roylei*
            8. Glumes not striate, imbricating, not inflated in fruit; stem not septate when dry..*S. lateriflorus*
         5. Nut punctate; inflorescence in a pseudo-lateral cluster; glumes aristate.. .. ..*S. squarrosus*
   2. Spikelet clusters terminal :
      9. Perennials; head solitary.. .. ..*S. kyllingioides*
      9. Annuals; head compound.. .. ..*S. michelianus*
1. Spikelets many, stalked, umbellate (often reduced to a single head in *S. affinis* and then, spikelets straw-coloured or almost white, and glume 2—fid at apex) :
   10. Inflorescence a lateral umbel; hypogynous bristles absent .. ..*S. brachyceras*
   10. Inflorescence a terminal umbel; hypogynous bristles present :
      11. Hypogynous bristles more or less retrorsely scabrid :
         12. Glumes 2-fid at apex; inflorescence a compound umbel or a capitate head; spikelets ovate-lanceolate, cylindric or ovate-oblong :
            13. Inflorescence mostly a head; spikelets straw-coloured or nearly white, ovate-lanceolate; stigmas 2... .. ..*S. affinis*
            13. Inflorescence a simple or compound umbel; spikelets yellowish-brown, cylindric-oblong, ovate-oblong or ellipsoid; stigmas 3.. .. ..*S. tuberosus*
         12. Glumes not 2-fid at apex; inflorescence decompound umbel of globose or broadly subglobosely-ovoid, sometimes ellipsoid head.. ..*S. grossus*
      11. Hypogynous bristles plumose..*S. littoralis* var. *subulatus*

Scanned by CamScanner

Scirpus affinis Roth in R. & S. Syst. Veg. 2:140. 1817 & Nov. Pl. Sp. 30. 1821. *Scirpus maritimus* L. var. *affinis* (Roth) Cl. in Hk f. FBI 659. 1893; C 3:408.

Perennial, solitary or tufted, 15–50 cm tall herbs. Leaves 8-20 cm long, narrowly linear. Spikelets 1–2.5×0.8–1 cm long, 2-6, in terminal head or veay rarely a compact umbel. Hypogynous bristles 4. Nut obovate-oblong, plano-convex, dark-brown, shining, smooth.

Throughout (except Saurashtra) with a very restricted distribution in localities of its occurrence, mostly along water courses; not common.

FLS & FRS : Sep.–Apr.

Scirpus articulatus L. Sp. Pl. 47. 1753; FBI 6:656; C 3:406.

Perennial, tufted herbs, 15–60 cm tall. Leaves 0. Spikelets 0.5–1.5 cm long, yellowish–to reddish–brown, ovoid–oblong or nearly cylindric, 7–27, sessile, clustered in a lateral head 1–4.5 cm in diameter. Nut obovoid, triquetrous, dark-brown to almost black, transversely undulately lineolate.

Throughout (except Kutch and Saurashtra) in moist ground; common, scattered or subgregarious.

FLS & FRS : Sep.–Apr.

Scirpus brachyceras Hochst. ex A. Rich. Tent. Fl. Abyss. 2:496. 1851. *Scirpus corymbosus* auct. non L. 1753; FBI 6:657; C 3:407.

Perennial, tufted herbs, 60–90 cm tall. Leaves 0. Spikelets 0.4-0.5 cm long, ovate-oblong, reddish-brown. Nut yellowish-brown, obovoid, obtusely trigonous.

North to south Gujarat, in a few restricted localities; rare.

FLS & FRS : Sep.–Oct.

Scirpus grossus L. f. Suppl. 104. 1781; FBI 6:659; C 3:408. *Scirpus kysoor* Roxb. Hort. Beng. 6. 1814 (nomen) & Fl. Ind. 1:230. 1820; C 3:409. *Scirpus grossus* L. f. var. *kysoor* (Roxb.) Cl. in Hk. f. FBI 6:660. 1893.

90–165 cm tall, stoloniferous, perennial herbs. Leaves 30–70×2–3 cm, linear, scabrid on margins. Hypogynous bristles 5–6, brown, unequal, longer than nut. Nut obovate–oblong, trigonous, yellowish-brown or pale–lead–coloured, apiculate, vertically lineolate.

Reported from Kutch (Blatter, 1909), north Gujarat (Shah, 1969) and south Gujarat-Surat (Solankey et al., 1972), but these authors do not give flowering and/or fruiting season.

Scirpus jacobi Fischer in Kew Bull. 1931: 103. 1931 & Fl. Madras 1156. 1957 (reprinted); Shah et al. in Indian For. 100 (2):121–122. 1974.

Annual, tufted herbs, 18–39 cm tall. Leaves 0. Spikelets 0.4–0.7 cm long, pale–yellowish–brown, broadly ovate, 4–9, in sessile head, 0.8–1 cm in diam. Nut broadly obovate, obtusely trigonous, blackish-brown, transversely lineolate.

North Gujarat (Idar) and central Gujarat (Lunawada); rare.

FLS & FRS : July–Oct.

Scirpus juncoides Roxb. Hort. Beng. 81. 1814 (nomen) & Fl. Ind. 1:216. 1820. *Scirpus erectus* auct. plur. non Poir. 1804; FBI 6:656.

Perennial, rhizomatous 30–45 cm tall herbs. Leaves 0. Spikelets 2–5, 1.5–2×0.5–0.7 cm, cylindric or obovate–oblong, brown or yellowish-brown, in sessile head. Nut broadly obovate or nearly suborbicular, biconvex, dark-brownish-black.

Shah C. K. (1963) reported it from north Gujarat (Sabarmati).

Scanned by CamScanner

Scirpus kyllingioides Boeck. in Linnaea 36:733. 1870; FBI 6:662; C 3:409.

Rhizomatous herbs. Leaves few, 6-17 cm long, involute, narrowly linear-lanceolate, scabrid on margins. Spikelets 0.2-0.3 cm long, ovoid-lanceolate, straw-coloured, often with a brownish tinge, in globose, terminal head, 0.5-0.7 cm across. Nut obovoid-oblong, trigonous or subcompressed, yellowish- or brownish-black, microscopically punctate.

Chhotaudepur forest division, Panchmahals and Dangs; rare.

FLS & FRS : Aug.-Sep.

Scirpus lateriflorus Gmel. Syst. Veg. 1:127. 1891. *Scirpus lateralis* Retz. Obs. 4:12. 1786 (non Forsk. 1775). *Scirpus supinus* auct. non L. 1753; FBI 6:655; C 3:406. *Scirpus supinus* L. var. *uninodis* Cl. in Hk. f. FBI 6:656. 1893; C 3:406 (non *Isolepis uninodis* Del.). *Scirpus supinus* L. var. *lateriflorus* (Gmel.) Koyama in Journ. Fac Sci. Univ. Tokyo 7:302. 1958; S & J 52; S 302.

6-70 cm tall, tufted annuals. Leaves 0. Spikelets 4-6, 0.5-1.3 cm long, ovate-oblong, oblong-lanceolate or ellipsoid, pale-brown or straw-coloured. Nut of two types: (a) nut produced from the normal position from flowering spikelets above the ground 0.1-0.12 cm long, broadly obovoid or nearly orbicular, acutely trigonous, brownish-black with prominent, transverse wavy ridges. (b) nut produced from basal part of stem from axil of leaf sheath at ground level, acutely or obscurely trigonous, chestnut-brown, oblong-ellipsoid or obovate, shortly apiculate or obtuse, without prominent transverse wavy ridge.

Throughout, a weed in cultivated fields and drying moist ground.

FLS & FRS : Sep.-Dec.

Scirpus littoralis Schrad. var. **subulatus** (Vahl) Chiov. Pl. Nov. Act. ex Aethiop. 16. 1928; S & J 52. *Scirpus subulatus* Vahl, Enum. Pl. 2:268. 1806. *Scirpus littoralis* auct. non Schrad. 1806; FBI 6:659; C 3:408.

Erect, perennial, 30-190 cm tall, stoloniferous herbs. Leaves 0. Spikelets 0.5-0.8 cm long, pale-yellow or yellowish-brown, ovoid-oblong or ellipsoid, in lateral, simple or compound umbels, often with a sessile spikelet at base of rays. Hypogynous bristles 4. Nut broadly obovoid, plano-convex or biconvex, pale-yellow to dull-brown, smooth.

Throughout; common, scattered or subgregarious.

FLS & FRS : Aug.-June

Scirpus michelianus L. Sp. Pl. 52. 1753; FBI 6:662; C 3:410.

Included on the authority of Cooke who (1958) lists it from Gujarat (Pali) on the authority of Woodrow.

FLS : Oct.

Scirpus roylei (Nees) Parker in Duthie, Fl. Upper Gang. Pl. 3:361. 1921; S & J 52. *Isolepis roylei* in Wt. Contrib. 107. 1834. *Scirpus quinquefarius* Buch.-Ham. in Wall. Cat. 3465. 1828 (nomen) ex Boeck. in Linnaea 36:701. 1870.

Annuals, tufted, 5-25 cm tall. Leaves 0. Spikelets 3-8, 1-1.5 cm long, yellowish-brown, oblong, in compact, 1.5-2 cm broad heads. Nut broadly obovoid-oblong, obtusely trigonous, dark-brown to black, transversely rugose.

Throughout, common.

FLS & FRS : Aug.-Oct.

Scirpus squarrosus L. Mant. 181. 1771; FBI 6:663; C 3:410.

Annuals, 8-30 cm tall. Leaves narrowly linear, glabrous, with margins involute. Spikelets 2-5, 0.3-0.6 cm long, cylindric, oblong or ovate-oblong, reddish-brown, in subterminal head. Nut oblong or oblong-obovate, trigonous, yellow or creamy-white, faintly transversely lineolate.

Throughout (except Saurashtra), but in a few restricted localities only; not common.

FLS & FRS : Oct.-Jan.

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Scirpus triangulatus Roxb. Hort. Beng. 81. 1814 (nomen) & Fl. Ind. 1:217. 1820. *Scirpus mucronatus* auct. non L. 1753; FBI 6:657.

Perennial, tufted, 40–50 cm tall, rhizomatous herbs. Leaves 0. Spikelets 7–8, 2.5–3×0.5–0.8 cm, cylindric or narrowly ovate-oblong, chestnut-brown to brownish-black, in sessile heads. Nut brownish-black, broadly obovate, acutely trigonous.

North Gujarat (Prantij) and south Gujarat (Songadh).

FLS & FRS : Nov.–May

Scirpus tuberosus Desf. Fl. Atlant. 1:50. 1798; *Scirpus maritimus* L. Sp. Pl. 51.1753 (p. p.); FBI 6:658; C 3:407; S & J 52.

Erect, perennial, 30–90 cm tall herbs with tuber bearing rhizomes. Leaves 12–40×0.5–0.8 cm, linear. Hypogynous bristles 3-6. Nut obovoid, obtusely trigonous or plano-convex, microscopically punctate.

Throughout, scattered or subgregarious, common.

FLS & FRS : Throughout the year.

SCLERIA Berg.

Key to species

1. Disc uniseriate 3-lobed; leaves 0.3-0.4 cm broad..*S. parvula*
1. Disc biseriate, each series 3-lobed; leaves 0.6-0.8 cm broad .. ..*S. stocksiana*

Scleria parvula Steud. Synop. Pl. Glum. 2:174. 1855. *Scleria tessellata* auct. non Willd. 1805; FBI 6:686; C 3:418; S 303.

Perennial, tufted herbs, 20–40 cm tall, with a small rhizome. Leaves 17–30 cm long, linear. Inflorescence terminal or subterminal, branched, leafy panicle. Nut nearly sessile, oblong-ellipsoid, chalky-white, tessellately canecellate.

Throughout (except Saurashtra and Kutch), but restricted in distribution; very rare.

Scleria stocksiana Boeck. in Linnaea 38:474. 1874; FBI 6:687; C 3:419; S 303.

Perennial, tufted, 15-55 cm tall, rhizomatous, non-stoloniferous herbs. Leaves 8-18 cm long, linear, scabrid on veins and margins. Inflorescence axillary and terminal, leafy panicle. Nut globosely-ellipsoid, truncate at base, terete or obtusely trigonous, densely canecellate-tessellate.

North Gujarat (Talod).

FLS & FRS : Sep.

POACEAE (GRAMINEAE) 150

Key to the groups

1. Spikelets 2-flowered, falling entire at maturity, usually with the upper floret hermaphrodite and the lower male or barren and if the latter, often reduced to the lemma or rarely the lemma entirely absent, all alike or more often differing in size, shape, structure, frequently dorsally compressed.. .. .. *Panicoideae*

1. Spikelets 1–to many-flowered, breaking up at maturity above the more or less persistent glumes, or if falling entire, then not 2-flowered with the lower floret male or barren and the hermaphrodite, usually more or less laterally compressed or terete, or if 2-flowered and falling entire, the glumes and lemmas all membranous and with a globose wrinkled seed which splits the palea when mature.. .. .. .. *Fooideae*

Key to the tribes of Panicoideae

1. Male and female spikelets in separate inflorescences or in different parts of the same inflorescence and of different appearance; lemmas hyaline or membranous and thinner than the glumes.. .. .. *Maydeae*

1. Spikelets all hermaphrodite or with male or barren and hermaphrodite spikelets mixed in the same inflorescence and so arranged that a male or barren spikelet is near a her-

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maphrodite spikelet, or if unisexual, then the lemma of fertile floret indurated :

2. Spikelets paired, similar or more often dissimilar, one sessile, other pedicelled; glumes as long as the spikelet and enclosing the florets, more or less rigid and firmer than lemmas; upper lemma usually awned.. ..*Andropogoneae*

2. Spikelets solitary or paired, more or less similar; glumes membranous; lower lemma usually smaller or sometimes suppressed; upper lemma papery to very tough and rigid, usually awnless.. .. ..*Paniceae*

Key to the genera of tribe Andropogoneae

1. Spikelets solitary, pedicelled or almost sessile at nodes of a tough or fragile rachis; inflorescence of a solitary or several racemes.. .. .. *Dimeria*

1. Spikelets in pairs, rarely in threes, similar or dissimilar, sessile and pedicelled, or one short, other long pedicelled. Inflorescence a panicle or compound racemes on a central axis :

2. Spikelets of each pair similar, the sessile and pedicelled hermaphrodite, rarely the sessile spikelet male and the pedicelled female (*Eriochrysis)* or bisexual *(Lophopogon)* and then joints of the panicles thin, linear or somewhat expanded at the top :

3. Spikelets arranged more or less in ample panicles or compound recemes arranged on a central axis :

4. Rachis of racemes tough or tradily breaking up; panicles narrow, contracted, silvery.. ..*Imperata*

4. Rachis of racemes breaking up; panicles expanded, silvery-white or pale to golden-yellow at least when fresh :

5. Spikelets awnless; panicles silvery.. ...*Saccharum*

5. Spikelets awned; panicles pale-to golden-yellow, at length straw-white.. .. ..*Spodiopogon*

3. Spikelets arranged in a single raceme or in several racemes, digitate or subracemose along a very short main axis :

6. Pedicelled spikelet much reduced, usually represented by a pedicel, very rarely present and then lower glume-distinctly truncate; stamens 2.. .. ..*Apocopis*

6. Pedicelled spikelet developed; stamens 3, rarely 2; glume not markedly truncate :

7. Upper lemma 2-toothed, awned... ...*Eulaliopsis*

7. Upper lemma deeply cleft, awned in the cleft :

8. Lower glume 2-keeled, depressed between the keels.. .. ..*Eulalia*

8. Lower glume convex on the back, at least at maturity.. .. .. ..*Lophopogon*

2. Spikelets in each pair dissimilar, sessile hermaphrodite, pedicelled male or sterile or completely absent or if more or less similar then joints of the racemes and the pedicel thick and swollen :

9. Joints of the rachis and pedicel of pedicelled spikelet swollen, 3-angled, rounded or flattened; sessile spikelet awned or not :

10. Sessile spikelet with a male and a hermaphrodite floret; upper lemma awned :

11. Racemes many-noded, not contained in a spathe-like sheath :

12. Racemes solitary, terminal; lower glume of sessile spikelet not transversely grooved :

13. Lower glume of sessile spikelet when young with two tufts of hairs, upper glume with one tuft; ligule membranous.. .. ..*Triplopogon*

13. Lower and upper glume of sessile spikelets without tufts of hairs; ligule a row of hairs.. .. .. ..*Sehima*

12. Racemes 2 to many; lower glume of sessile spikelet often with nodules on the margins or transversely furrowed :

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14. Pedicelled spikelets well developed; lower glume often transversely wrinkled, furrowed or with nodules on margins.. .. .. .. *Ischaemum*

14. Pedicelled spikelet reduced to linear, curved pedicel; lower glume covered all over with transverse ridges which are broken up into warts or teeth .. .. *Thelepogon*

11. Racemes 1–noded, reduced to three heteromorphous spikelets, enclosed in a boat-shaped spathe.. .. .. *Apluda*

10. Sessile spikelet with hermaphrodite floret only or occasionally with a male floret below; upper lemma unawned :

15. Lower glume of sessile spikelet pitted, perforated, ridged or variously sculptured :

16. Sessile spikelet strongly dorsally compressed; lower glume with a broad wing on each keel.. .. .. .. *Manisuris*

16. Sessile spikelet spherical; lower glume not winged.. .. .. .. *Hackelochloa*

15. Lower glume of sessile spikelet not as above :

17. Racemes covered with shaggy hairs .. .. *Elyonurus*

17. Racemes mostly glabrous, not conspicuously hairy :

18. Axis of the spikes tough, not breaking up; spikelets paired at each node of the axis; pedicels not fused to the joint.. .. .. *Hemarthria*

18. Axis of the spikes fragile, breaking up; spikelets solitary, at each node of the axis; pedicel fused to the joint :

18a. Spikelets paired, one sessile, other pedicelled; pedicelled spikelet male or neuter .. .. .. *Rottboellia*

18a. Spikelets solitary, sessile, the pedicelled suppressed or neuter.. *Ophiuros*

9. Joints of the rachis and pedicel narrow, seldom thickened upwards, occasionally with a translucent longitudinal groove; sessile spikelet usually awned :

19. Inflorescence a terminal raceme.. .. *Triplopogon* and *Sehima* (see also character 13)

19. Inflorescence a panicle :

20. Spikelets in racemes which are not interrupted by spathes or solitary at ends of branches; racemes collected into whorled panicles; joints and pedicels not furrowed :

21. Spikelet solitary at the ends of branches .. .. *Cleistachne*

21. Spikelets in pairs or threes :

22. Spikelets dorsally compressed.. *Sorghum*

22. Spikelets compressed from the sides :

23. Spikelets in groups, each consisting of a sessile and two more or less reduced pedicelled spikelets or a raceme of several pairs; lower glume not tuberculate.. *Chrysopogon*

23. Spikelets many paired, in whorled racemes; lower glume tuberculate.. .. .. *Vetiveria*

20. Panicles of racemes interrupted by spathes or espatheate racemes digitate or paired or solitary and terminal, sometimes joints and/or pedicel with a translucent median furrow :

24. Upper lemma of sessile spikelet with a basal awn.. .. .. .. *Arthraxon*

24. Upper lemma of the sessile spikelet awned from the tip or from the cleft or upper lemma reduced to a hyaline base of the awn :

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25. Upper lemma of sessile spikelet not cleft, often stipitate and passing into the awn (except *Pseudosorghum*) :

26. Margins of the lower glume of the sessile spikelets sharply infolded, 2-keeled; awn glabrous :

27. False racemes of spikelets at ends of branches of true panicles.. .. .. .. *Capillipedium*

27. False racemes of spikelets not as above :

28. Racemes supported by a spathe; sessile spikelet not overlapping :

29. Racemes with two fertile spikelets; lower glume not pitted.. .. *Pseudanthistiria*

29. Racemes with many fertile spikelets; lower glume pitted or not .. ..*Eremopogon*

28. Racemes several to many, if solitary, then sessile spikelets imbricate :

30. Joints and pedicels with a translucent, longitudinal furrow; glumes sometimes pitted .. ..*Bothriochloa*

30. Joints and pedicel without a translucent furrow; glumes not pitted :

31. All pairs of spikelets heterogamous; upper lemma of sessile spikelet bifid .. .. *Pseudosorghum*

31. Lowest 1-3 pairs of spikelets homogamous; upper lemma of sessile spikelet reduced to a translucent base of an awn.. .. .. ..*Dichanthium*

25. Upper lemma of the sessile spikelet 2-lobed or 2-cleft, awned in the sinus :

32. Aromatic grasses; racemes in pairs, supported by spathes, often forming panicles; one pair of spikelet in each raceme homogamous, male or neuter, all other pairs heterogamous.. .. ..*Cymbopogon*

32. Grasses not aromatic; racemes 2-nate or more, rarely digitate, usually all pairs of spikelets heterogamous and all sessile spikelets hermaphrodite and alike or the lowest more or less reduced and barren but still resembling the upper fertile spikelet.. ... .*Andropogon*

26. Margins of lower glume inturned and rounded at the sides, at the most, keeled upwards; awn usually hairy :

33. Racemes solitary at ends of branches, surrounded at the base of an involucre of homogamous spikelets :

34. Involucral spikelets pedicellate, deciduous; callus of fertile spikelets very short, truncate or obtuse: .. ..*Iseilema*

34. Involucral spikelets sessile, not deciduous; callus of the fertile spikelets pointed .. .. *Themeda*

33. Racemes without an involucre .. .. *Heteropogon*

TRIBE MAYDEAE

Key to genera

1. Female spikelets completely enclosed in a metamorphosed leaf-sheath which forms a spherical or cylindrical bead-like false involucre.. .. .. *Coix*

1. Female spikelets not enclosed in a false involucre :

2. Female spikelets in crowded longitudinal rows on a very thick axis; male spikelets in ample, terminal panicle...*Zea*

2. Inflorescence, especially the female, not as above :

3. Lower glume of the female spikelet 3-lobed, the central lobe larger than the others.. .. *Trilobachne*

3. Lower glume of the female spikelet not 3-lobed, at most with 2 to 3 small teeth.. .. ..*Chionachne*

TRIBE PANICEAE

Key to genera

1. Inflorescence of 1-3 racemes, with broad, flat and disarticulating rachis; spikelets 1-6, clustered, mixed with scale-like glumes.. .. ..*Trachys*

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1. Inflorescence panicle, head or raceme, but then, rachis not as above; spikelets not clustered, surrounded by empty glumes:
2. Spikelets usually unisexual.. .. .. ..*Spinifex*.
2. Spikelets all similar in shape and sex :
3. Spikelets falling singly, not subtended by bristles, or if so, then bristles persisting after the spikelets have fallen (*Setaria*) :
4. Spikelets arranged in more or less open panicles or with panicles contracted and spike-like racemes:
5. Spikelets not subtended by bristle-like branches :
6. Spikelets arranged in open or contracted panicles; spikelets not or slightly gibbous..*Panicum*
6. Spikelets arranged in cylindrical spike-like panicles; spikelets more or less gibbous . .. .*Sacciolepis*
5. Spikelets subtended by bristle-like branches .. ..*Setaria*
4. Spikelets arranged in one-sided spikes or spike-like racemes which are digitate or scattered, rarely solitary :
7. Lemma of the upper floret more or less crustaceous, with narrow inrolled margins :
8. Lower glume and lowest internode of rachilla not forming a swollen callus at base of the spikelets :
9. Lower glume (when present) turned away from rachis of racemes or spike, the back of the upper lemma facing it i. e. spikelets abaxial :
10. Lower glume present, though small :
11. Glumes acuminate or awned, rarely only acute; upper lemma not mucronate :

12. Leaf-blades linear; racemes dense; culms erect or sub-erect .. .. *Echinochloa*
12. Leaf-blades lanceolate to ovate-lanceolate; racemes loose or moderately dense; culms creeping or ascending .. .. .. *Oplismenus*
11. Glumes awnless, if acuminate, upper lemma mucronate :
13. Upper lemma acute, not mucronate.. ..*Paspalidium*
13. Upper lemma obtuse, mucronate or very shortly awned .. .. ..*Urochloa*
10. Lower glume absent and spikelets plano-convex.. .. ..*Paspalum*
9. Lower glume turned towards the rachis, the back of the upper lemma turned away from it, i. e. spikelets adaxial .. .. *Brachiaria*
8. Lower glume and lowest internode of the rachilla forming a swollen callus at the base of the spikelet; upper lemma mucronate or short awned.. .. .. ..*Eriochloa*
7. Lemma of the upper floret thinly cartilaginous, usually with flat margins :
14. Spikelets awnless.. .. ..*Digitaria*
14. Spikelets awned .. .. ..*Alloteropsis*
3. Spikelets with an involucre of bristles or subtended by a solitary bristle and falling with or without bristles at maturity, solitary or in clusters :
15. Upper lemma smooth; bristles caducous :
16. Bristles numerous, formed of highly modified bristle or spike-like branches :

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17. Involucre of free, naked or plumose bristles.. .. .. ..*Pennisetum*

17. Involucre of spines of rigid bristles united at the base often into a hard cup.. .. ..*Cenchrus*

16. Bristles solitary; formed by the prolongation of the branch beyond the terminal spikelet.. .. .. *Pseudoraphis*

15. Upper lemma transversely rugose; bristles persistent.. ... ...*Setaria*

GROUP POOIDEAE

Key to the tribes

1. Lamina transversely veined and articulate on the sheath .. ..*Bambuseae*

1. Lamina not as above :

2. Spikelets borne in open or contracted spike-like panicles, less often in racemes or spikes :

3. Spikelets usually with two or more fertile florets or if with one fertile floret then with sterile reduced floret above it (see Chlorideae) :

4. Lemma and rachilla glabrous or hairy but with hairs not enveloping the lemma, or if so, the lemma with a geniculate awn; low or moderately tall grasses :

5. Glumes usually shorter than the lowest floret and with upper floret distinctly exerted, rarely longer and then with firm dull margins like lemmas or lemma firmly keeled :

6. Lemmas usually 7-9-nerved; inflorescence a simple spike or globular head of spikelets .. ..*Aeluropodeae (Aeluropus)*

6. Lemmas 1-3-nerved; inflorescence of panicles or racemes :

7. Inflorescence of panicles, if racemes or spikes, spikelets not secund....*Eragrosteae*

7. Inflorescence of racemes or panicles of racemes and spikelets secund.. .. ..*Chlorideae*

5. Glumes usually as long as or longer than the lowest floret often as long as the spikelet and enclosing the floret.. .. .. ..*Aveneae (Avena)*

4. Lemma or rachilla joints bearing long silky hairs which envelop the lemma; tall grasses with large, plume like panicles.. .. .. ..*Arundineae*

3. Spikelets with one fertile floret (male or female in unisexual, 1-flowered spiklets), with or without one or two male or barren florets below it, the latter often much reduced :

8. Glumes minute or suppressed; fertile lemma and palea very similar in shape and texture....*Oryzeae*

8. Glumes well developed, fertile lemma and palea not similar :

9. Spikelets with 2 florets, the lower male or barren, the upper hermaphrodite :

10. Lower floret empty and with a palea; glumes upto half the length of the spikelet; rachilla produced beyond the upper floret; spikelets falling with part of the pedicel attached.. .. ..*Thysanolaeneae (Thysanolaena)*

10. Lower floret male or barren, usually with a palea; upper glume as long as the spikelet; rachilla disarticulating below the upper floret and not produced beyond it; glumes more or less persistent :

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11. Glumes equal in size, obtuse or mucronate; upper lemma unawned.. *Isachneae (Isachne)*

11. Glumes unequal, lower acute, upper acuminate; upper lemma awned or bristled.. .. *Arundinelleae (Arundinella)*

7. Spikelets with one fertile floret :

12 Glumes more or less persistent; spikelets very rarely falling entire and then with firmly membranous or coriaceous, awned or 5–nerved lemma :

13. Lemmas hyaline or membranous at maturity, rarely indurated and then spikelets laterally compressed, awnless or awned from low down on the back or from middle or from the entire or bifid tip; awns when present not trifid :

14. Lemmas usually 3–5–nerved frequently awned; glumes longer and firmer than the hyaline lemma or when the lemma is longer than the latter indurated; grain usually with an adherent pericarp. .*Agrostideae (Polypogon)*

14. Lemmas usually 1–3–nerved, awnless; glumes and lemmas very similar in texture, hyaline or thinly membranous; grain usually free with a free pericarp.. .. .. *Sporoboleae*

13. Lemmas indurated or rigid at maturity, terete or dorsally compressed; awns trifid.. .. .. *Aristideae (Aristida)*

12. Spikelets falling entire at maturity, either singly or in clusters from the axis of slender, spike–like panicles or racemes; lemmas 1–3–nerved :

15. Spikelets fascicled or solitary; glumes not awned.. .. .. *Zoysieae*

15. Spikelets solitary; glumes awned.. *Perotideae (Perotis)*

2. Spikelets sessile or shortly pedicelled, along one side of the rachis of solitary, digitate or scattered spikes, spike–like racemes or on opposite sides of the rachis of solitary spike or raceme :

16. Spikelets on opposite sides of the rachis of solitary spike or spike–like raceme.. .. .. *Triticeae*

16. Spikelets secund on a tough rachis; inflorescence of digitate or solitary spikes or panicle of spikes.. .. .. *Chlorideae*

TRIBE CHLORIDEAE

Key to genera

1. Inflorescence terminal, spicate, not of digitate or racemose spikes; lemmas not obovate :

2. Inflorescence of spaced cluster of awned spikelets on a simple rachis .. .. *Melanocenchris*

2. Inflorescence a simple spike or spikes of awned or awnless spikelets :

3. Spikelets more or less sunk in the thick, tough rachis .. .. *Oropetium*

3. Spikelets not sunk in a thick rachis.. .. *Schoenefeldia*

1. Inflorescence of spikes digitate or racemose, very rarely solitary and then lemmas obovate :

4. Spikelets with one or more fertile florets and one or more imperfect florets above them :

5. Spikes 1–3; fertile florets 2 or more .. .. *Tetrapogon*

5. Spikes 4 or more; fertile florets only one .. *Chloris*

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4. Spikelets with one fertile floret and no imperfect florets :
6. Spikelets awnless .. .. *Cynodon*
6. Spikelets awned.. .. .. *Schoenefeldia*

TRIBE ARUNDINEAE

Key to the genera

1. Lemmas glabrous; rachilla long-villous.. .. .. *Phragmites*
1. Lemmas hairy all over on the back; rachilla glabrous.. .. .. *Arundo*

TRIBE BAMBUSEAE

1. Plants thorny.. .. .. *Bambusa*
1. Plants not thorny.. .. .. .. *Dendrocalamus*

TRIBE ERAGROSTEAE

Key to genera

1. Lemmas usually entire at the apex, obtuse, acute or acuminate or if 2-toothed *(Acrachne)* or awned from the tip *(Elytrophorus)* then glabrous near margins and along side nerves :
2. Glumes aristate or aristate-acuminate; inflorescence a narrow panicle; spikes deflexed on flattened rachis.. .. .. *Dinebra*
2. Glumes obtuse, acute or acuminate but not aristate, rarely the upper awned and the spikelets then in digitate spikes or short racemes of spikes; spikes erect :
3. Internodes of the rachilla bearded with long hairs .. .. *Halopyrum*
3. Internodes of the rachilla glabrous or only shortly hairy:
4. Spikelets in open, contracted or spike-like panicles, rarely in solitary, secund spikes. (*Eragrostiella*) :
5. Spikelets awnless :
6. Inflorescence a panicle, often effuse, or sometimes contracted into spike-like and cylindric .. .. *Eragrostis*

6. Inflorescence a secund spike.. .. *Eragrostiella*
5. Spikelets awned, in dense, globose clusters.. .. .. *Elytrophorus*
4. Spikelets sessile or very short pedicelled, loosely to densely imbricate in digitate or racemosely arranged spikes or spike-like racemes :
7. Axis and branches of the inflorescence ending in a spikelet :
8. Spikelets falling entire at maturity from the axis of straight spikes; spikes numerous racemosely crowded into long, narrow, dense panicles.. .. .. .. *Desmostachya*
8. Spikelets breaking up at maturity; spikes few to several, digitate, subdigitate or in pseudo-whorls or scattered :
9. Spikes digitate or subdigitate; spikelets 3-6-flowered; grain oblong to globose, grooved with a loose, conspicuous pericarp.. .. .. .. *Eleusine*
9. Spikes in pseudo-whorls or scattered but not forming panicle; spikelets 8-20-flowered; grain coarsely rugose, grooved or hollowed on one face, with caducous pericarp.. .. .. .. *Acrachne*
7. Axis of spikes terminating into a sharp point .. .. *Dactyloctenium*
1. Lemmas usually emarginate or 2-4-lobed or toothed at apex, rarely entire and then hairy along the nerves :
10. Spikelets in slender, more or less secund, racemosely arranged racemes :
11. Racemes densely spiculate, conspicuously secund; spikelets oblong, laterally compressed; lemmas keeled .. .. *Leptochloa*
11. Racemes loosely spiculate; spikelets linear-oblong, terete; lemmas not keeled.. .. .. *Diplachne*

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10. Spikelets in terminal, solitary, secund spikes.. ..*Tripogon*

TRIBE ORYZEAE

Key to genera

1. Leaf-blades ovate-oblong or ovate-lanceolate with inflated sheaths; grass floating.. .. ..*Hygroryza*
1. Leaf-blades linear, acute to acuminate; sheaths not inflated; grass not floating.. .. .. *Oryza*

TRIBE SPOROBOLEAE

Key to genera

Inflorescence spicate, very dense, subtended by an inflated sheath bearing a rudimentary blade .. .. .. *Crypsis*

Inflorescence a panicle or spike-like and elongate; sheath inflated :

2. Inflorescence elongate, spike-like; fruit with a conspicuous beak.. .. ..*Urochondra*
2. Inflorescence a panicle; fruit not beaked.. ..*Sporobolus*

TRIBE TRITICEAE

Key to genera

1. Spikelet usually solitary at each node of the spike axis.. ... . *Triticum*
1. Spikelets more than one at each node of the spike axis .. ..*Hordeum*

TRIBE ZOYSIEAE

Key to genera

1. Glumes of the spikelets with recurved spines or one armed and other smooth; spikelets arranged in erect racemes ..*Tragus*
1. Glumes of the spikelets smooth; spikelets arranged in rigid, erect spikes.. .. ..*Zoysia*

ACRACHNE W. & A.

Acrachne racemosa (Heyne ex R. & S.) Ohwi in Bull. Tokyo Sci. Mus. (n. 18) 1.1947; Bor, Grasses of Burma, Ceylon, India & Pakistan 487. 1960; Patel in Ind. For. 91:332. 1965; S & J 52. *Eleusine racemosa* Heyne ex R. & S. Syst. Veg. 2:583. 1817. *Eleusine verticillata* Roxb. Fl. Ind. 1:346. 1820; FBI 7:295; Blatter & McCann, Bombay Grasses 260. t. 174. 1935; WI 3:166.

Erect or suberect, 40–75 cm tall, simple or branched, polished, glabrous herbs. Leaves 8–22 × 0.2–0.5 cm, linear. Spikes 6–8 cm long, few to many, scattered or whorled, alternate, opposite or subdigitately arranged, many-flowered. Spikelets 0.3–0.4 cm long, glabrous, pale-green, at length straw-coloured.

Throughout; common. (CHINKHE, JAURA)

FLS & FRS : July–Dec.

AELUROPUS Trin.

Aeluropus lagopoides (L.) Trin. ex Thw. Enum. Pl. Zeyl. 354. 1864 (*sphalm. lagopodioides*); Bor 380; Patel 91:328; S & J 52. *Dactylis lagopoides* L. Mant. 33. 1767. *Dactylis repens* Desf. Fl. Atlant. 1:79. t. 15. 1798. *Aeluropus villosus* Trin. ex C. A. Mey. Verz. Pfl. Cauc. 18. 1831; FBI 7:334; C 3:567. *Aeluropus repens* (Desf.) Parl. Fl. Ital. 1:462. 1848; Blatter & McCann 277. t. 33.

Perennial, rigid, tufted, prostrate herbs, with erect branches. Leaves 0.5–2 cm long, narrowly lanceolate, flat. Spike 0.8–1.5 cm long, subglobose or oblong; spikelet 0.2–0.3 cm long, villous.

Throughout, along sea coast, often in large patches; common.

FLS & FRS : Aug.–Jan.

ALLOTEROPSIS J. S. Presl ex C. B. Presl emend. Hitch.

Alloteropsis cimicina (L.) Stapf in Prain, Fl. Trop. Afr. 9:487. 1919; Blatter & McCann 129 t. 63; Bor 276; Patel 91:321; Ch & O 254; S & J 52. *Milium cimicinum* L. Mant. Alt. 184. 1771. *Panicum cimicinum* (L.) Retz. Obs. 3:9. 1783. *Axonopus cimicinus* (L.) P. Beauv. Agros. 12, 812; FBI 7:64; C 3:441.

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Perennial, 30–45 cm tall, tufted, erect or geniculately ascending herbs. Leaves 2–10.5 × 1–1.5 cm, ovate to ovate-lanceolate, glabrous but for ciliate margins. Spikes 4–6, 7–15 cm long, digitate, terminal; spikelets 0.3–0.5 cm long, ovoid, compressed, solitary or geminate. Grain ellipsoid-oblong, dorsally compressed, glabrous, blackish-brown.

Throughout, common.

FLS&FRS : Aug.-Nov.

ANDROPOGON L.

Andropogon pumilus Roxb. Fl. Ind. 1:277. 1820; FBI 7:170; C 3:495; Blatter & McCann 99. t. 65; WI 1:78; Bor 93; Patel 91:311; S & J 52.

Annuals, 30–45 cm tall, tufted, slender herbs. Leaves 3–6.5 cm long, linear, flat, glabrous. Racemes 0.6–2.5 cm long, in nearly equal pairs on a slender peduncle. Sessile spikelet 0.4–0.5 cm long. Spathe 0.6–1.2 cm long, glabrous, flattened.

Saurashtra, Surat, Broach, Rajpipla; rather rare. (ZINZUO)

FLS & FRS : Aug.-Jan.

APLUDA L.

Apluda mutica L. Sp. Pl. 82. 1753; Bor 93; Patel 91:311; Ch & O 242; S & J 52; S 303. *Apluda aristata* L. Amoen. Acad. 4:303. 1756. *Apluda varia* Hack. in DC. Mon. Phan. 6:196. 1889; FBI 7:150; C 3:474. *Apluda varia* Hack. subsp. *aristata* (L.) Hack. Mon. Androp. in DC. Mon. Phan. 6:196. 1889; FBI 7:150. Blatter & McCann 29. t. 20. *Apluda mutica* L. var. *aristata* (L.) Pilger in Pamf. (ed. 2). 14 e :130. 1945.

Perennial herbs, 0.45–1.5 cm tall, erect or geniculately ascending at base. Leaves 3–20 × 0.3–0.8 cm, flat, linear-lanceolate, petiolate. Panicles 5–15 cm long, terminal, of numerous, simple racemes or false spikes, each subtended by spathe. Spikelets 0.6–1 cm long, polished, greenish-yellow.

Throughout, gregarious, everywhere; common.

FLS&FRS : Aug.-Dec.

APOCOPIS Nees

Apocopis vaginata Hack. in Ost. Bot. Z. 41:8. 1871; Blatter & McCann 26; Bor 96; Patel 91:311. *Apocopis wightii* Nees ex Steud. var. *vaginata* Hk. f. in Hk. f. FBI 7:143. 1896; C 3:486.

Erect or decumbent, tufted herbs. Leaves 2–5 × 0.2–0.4 cm, glabrous or thinly hairy, with hairy sheathing leaf bases. Spike 1–4 cm long, mostly two together, included or not, in strongly nerved, hairy, spathiform sheaths. Spikelets alternately awned and awnless.

Patel (1965) lists it from Gujarat (excluding Saurashtra and Kutch), as occurring in pure patches.

FLS & FRS : Aug.– Oct.

ARISTIDA L.

Key to species

1. Articulation between lemma and awn not present at tip or at top of prolongation (column) :
   2. Lateral awns much reduced and of a different texture from the third awn, sometimes absent altogether.. ..*A. redacta*
   2. Lateral awns well developed and of the same texture as the third awn :
      3. Panicles effuse :
         4. Spikelets green or yellowish-green at maturity; lower glume 12 mm long with an awn 2 mm long; lemma (with a callus 2 mm long) about 12 mm long; panicle 20 cm long .. .. *A. hystrix*
         4. Spikelets mostly purplish at maturity; lower glume 15 mm long; lemma (with densely hairy callus 1 mm long) upto 15 mm long; panicle 30–40 cm long .. .. *A. cynantha*

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3. Panicles contracted :

5. Glumes long awned; awns 3–5 mm long..*A. setacea*

5. Glumes with awns only upto 2 mm long; at times glume without awn :

6. Glumes awned, unequal; lower glume not over two-thirds the length of upper.. ..*A. depressa*

6. Glumes not awned and not very unequal; lower glume more than two-thirds the length of upper.. ..*A. adscensionis* subsp. *adscensionis*

1. Articulation between lemma and awn present at tip or centre of lemma or at top of prolongation :

7. Lower glume always longer than the upper :

8. Column of awns less than 2 cm long.. ..*A. royleana*

8. Column of awns longer than 2 cm.. ..*A. funiculata*

7. Lower glume always shorter than the upper..*A. histricula*

Aristida adscensionis L. subsp. **adscensionis**; Bor 407. t. 43. *Aristida adscensionis* L. Sp. Pl. 82. 1753; Blatter & McCann 209. t. 138; Patel 91:328; S & J 52.

Annual or perennial, 30–45 cm tall, tufted, erect or geniculately ascending herbs Leaves 7–15 × 0.3–0.6 cm, narrowly linear, flat, scabrulous. Panicles 10–50 cm long, contracted, subsecund. Spikelets 0.5–0.7 cm long, ovoid-oblong to oblong-lanceolate.

Throughout everywhere; common and abundant, gregarious. (UTH-LAMPDO, DABHOLU, LAPDU).

FLS&FRS : Aug.–Jan.

Aristida cyanantha Nees ex Steud. Syn. Pl. Glum. 1:141. 1854; Bor 409.

Perennial, tufted herbs, erect or basally geniculately ascending. Leaves 4–6 × 0.2–0.6 cm, lanceolate, glabrous or nearly so. Panicles 25–30 cm long, effuse. Spikelets 0.8–1.5 cm long, terete, 1.2–1.7 cm long, awned.

Rajpipla (Kevadia); rare.

FLS&FRS : Aug.

Aristida depressa Retz, Obs. 4:22. 1786; Bor 409; Ch & C 264. *Aristida adscensionis* auct non L.; FBI 7:224; C 3:529.

This species is very similar to *A. adscensionis* but differs in the glumes which are awned in *A. depressa* Retz. and unawned in *A. adscensionis* L.

Pavagadh, in dry waste lands in plains and upper parts of hills.

FLS & FRS : Aug.–Dec.

Aristida funiculata Trin. & Rupr. Sp. Gram. in Mem. Acad. Sci. Petersb. (Ser. VI) 7:159. 1842; FBI 7:226; C 3:530; Blatter & McCann 214. t. 142; Bor 410; Patel 91:328; S & J 52

30–45 cm tall, erect or geniculate, very slender annuals. Leaves 2.5–7 cm long, convolute or flat, ciliate on margins atleast towards base. Panicles 8–15 cm long, lax, narrow. Spikelets 0.6–0.8 cm long, with 3–4 cm long awns.

Common in sandy soil and dry ground.

FLS & FRS : Sep.–Nov.

Aristida histricula Edgew. in Journ. Linn. Soc. 6:208. 1862; FBI 7:227; C 3:530; Blatter & McCann 214; Bor 410; Patel 91:329.

Slender annuals, 20–45 cm tall, densely tufted at base. Leaves 1–2.5 cm long, subulate, somewhat curved, convolute, glabrous. Panicles 1.5–2.5 cm long (excluding awns). Spikelets 0.8–1.2 cm long.

Kutch and Saurashtra in sandy soil. (MAOPADI, BHOIN-LAMPDO)

FLS & FRS : Sep.–Nov.

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Aristida hystrix L. f. Suppl. Pl. 113. 1781; FBI 7:225; C 3:529; Blatter & McCann 211. t. 140; Bor 410; Patel 91:329; Ch & O 264.

Perennial herbs, sometimes proliferously branched, 15-60 cm long, geniculately ascending from creeping root-stocks. Leaves 3.5-10×0.1-0.3 cm, convolute, rather glaucous. Panicles 10-15 cm long and as much broad. Spikelets (excluding awns) 0.8-1 cm long, straw-coloured.

Patel (1965) reports it from dry hills in Gujarat (see also Chavan & Oza, 1966); but Blatter & McCann report it from sandy hills at Daman.

FLS & FRS : Aug.-Dec.

Aristida redacta Stapf in Kew Bull. 1892:85. 1892; FBI 7:227; C 3:531; Blatter & McCann 215; Bor 412; Patel 91:329; Ch & O 264; S & J 52.

Annual or sometimes perennial, tufted, 15-60 cm tall, simple or branched, glabrous herbs. Leaves 10-15 cm long, very slender, convolute, hairy above, glabrous beneath, rough on margins. Panicles 15-25 cm long, branches geminate. Spikelets on slender pedicels, long awned.

On dry hills and dry plain ground. (LAPDO)

FLS & FRS : Sep.-Oct.

Aristida royleana Trin. et Rupr. Sp. Gram. Stip. 160. 1842 & in Mem. Acad. Sci. Petersb. (Ser. VI) 7:160. 1843; Bor 412; S & J 52. *Aristida funiculata* Trin. et Rupr. var. *royleana* (Trin. et Rupr.) Hk. f. FBI 7:227. 1896.

8-10 cm tall, tufted herbs, with glabrous culms. Leaves very narrowly linear, erect or spreading, glabrous, 1-4 cm long. Spikelets 0.8-1 cm long.

There are two specimens in the Blatter Herbarium from Rajkot, Saurashtra (*HS* 13512 and one presented by Bombay natural History Society).

FLS & FRS : Sep.-Oct.

Aristida setacea Retz. Obs. 4:22. 1786; FBI 7:225; C 3:529; Blatter & McCann 211. t 139; Bor 412; Patel 91:329; Ch & O 264; S & J 52; S 303.

Perennial herbs, 30-45 cm tall, tufted, slender, erect or basally geniculately ascending. Leaves 8-20 cm long, narrowly linear, scabrulous. Panicles 10-25 cm long, subsecund, contracted. Spikelets 0.6-0.8 cm long, very narrowly linear-cylindric; awns 1-1.5 cm long.

North Gujarat and Saurashtra; not common. (THOLU, LAPDU)

FLS & FRS : Sep.-Jan.

ARTHRAXON P. Beauv.

Key to species

1. Lower glume of sessile spikelets rounded on the back, not keeled; spikelets laterally compressed :
   2. Pedicelled spikelets, at least in the upper part of raceme, developed.. .. ..*A. lancifolius*
   2. Pedicelled spikelets not developed :
      3. Stamens 2 :
         4. Pedicel reduced to minute, glabrous point; joints sparingly ciliate, 1.75-2 mm long; upper glume puberulous at apex.. .. ..*A. quartinianus*
         4. Pedicel one-half to three-quarters of the length of sessile spikelet; joints sub-glabrous, upper glume hispid at apex or muriculate.. .. ..*A. hispidus*
      3. Stamens 3.. .. ..*A. inermis*
1. Lower glume of sessile spikelet 2-keeled, sometimes almost flat on back; spikelets laterally compressed :
   5. Lower glume of sessile spikelets 5-7 mm or less long with pectinately toothed, spinulose, hooked or tubercled keels; upper hooks, spines, tubercles or teeth not penicillate:

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6. Lower glume flat on back or slightly convex with strongly marked nerves, pectinate on keels from base to apex but not muricate on intermediate nerves .. ..*A. lanceolatus*

6. Lower glume rounded on back, often cylindrical but keeled, pectinate on keels and often muricate on intermediate nerves as well near the tip.. ..*A. prionodes*

5. Lower glume of sessile spikelet 7 mm long; keels with double row of tubercles, gradually becoming spinulose towards apex; upper tubercles penicillate .. *A. meeboldii*

Arthraxon hispidus (Thunb.)Makino in Bot. Mag. Tokyo 26: 214. 1912; Bor 99. *Phalaris hispida* Thunb. Fl. Jap. 44. 1784; *Arthraxon ciliaris* P. Beauv. Ess. Agrost. 111: 152. t. 11. f. 6. 1812 (p.p.); FBI 7: 145; C 3: 489.

Prostrate herbs, with creeping stem; culms tufted, ascending. Leaves 2-7 × 1-2 cm, ovate to ovate-lanceolate, glabrous or sparsely hairy, ciliate on margins. Racemes few to many forming terminal panicles. Spikelets 0.3–0.5 cm long, linear to linear-lanceolate.

Dangs (*Saxton* 2646); Chamargaon (Cooke, 1958).

FLS & FRS : Oct.–Nov.

Arthraxon inermis HK.f. in HK f. FBI 7:145. 1896; C 3:487; Blatter & McCann 74. t. 45; Bor 100; Patel 91:311.

Slender, much geniculately branched annuals, glabrous but for pubescent nodes. Leaves 2–4×1–1.5 cm, ovate, broadly amplexicaul, glabrous or sparsely hairy. Spikes 1-3, pedunculate. Spikelets oblong-lanceolate, all sessile, rather distant, awned, awns twice as long as spikelet.

In shaded parts in south Gujarat (Patel, 1965).

FLS & FRS : Aug.–Oct.

Arthraxon lanceolatus (Roxb.) Hochst. in Flora 39:188. 1856; Bor 1856; Bor 100; S & J 52. *Andropogon lanceolatus* Roxb. Fl. Ind. 1:262. 1820.

This species is likely to be confused with *A. prionodes* (Steud.) Dandy but differs from it in having a very characteristic lower glume (see key).

Saurashtra (Santapau & Janardhanan, 1967).

Arthraxon lancifolius (Trin.) Hochst. in Flora 39:188. 1856; Blatter & McCann 77. t. 48; Bor 100; Patel 91:311; Ch & O 246; S & J 52. *Andropogon lancifolius* Trin. in Mem. Acad. Sci. Petersb. (Ser. VI) 2:271. 1832. *Andropogon microphyllus* Trin. in Mem. Acad. Sci. Petersb. (Ser. VI) 2:275. 1832; *Arthraxon microphyllus* (Trin.) Hochst. in Flora 39:188. 1856; FBI 7:147; C 3:488.

Annual, tufted, 15–45 cm tall, slender, straggling, simple or branched herbs, glabrous or puberulous below inflorescence. Leaves 2–4×0.4–1 cm, flat, ovate, elliptic or lanceolate, glabrous or sparsely hairy. Racemes 3–5, 1.5–3 cm, digitate. Spikelets 0.25–0.3 cm long, solitary, sessile or rarely with a pedicelled one, laterally compressed.

Throughout, commonly on old walls.

FLS & FRS : Aug.–Dec.

Arthraxon meeboldii Stapf in Kew Bull. 1908: 449. 1908; C 3:488; Blatter & McCann 76. t. 47; Bor 101; Patel 91:311; S 304.

15–30 cm long, geniculately ascending from shortly prostrate base, slender herbs, quite glabrous but for pubescent nodes. Leaves 2–5×0.6–2 cm, ovate-lanceolate, sparsely bulbous-based hairy, ciliate on margins, amplexicaul. Panicles of 2–4, 4–5 cm long racemes. Sessile spikelet 0.6–1 cm long, narrowly linear-lanceolate; pedicellate spikelet closely appressed to and shorter than sessile one, lanceolate, acute.

South Gujarat (Patel, 1965). (PANDADIU)

Scanned by CamScanner

Arthraxon prionodes (Steud.) Dandy in Andrews, Fl. Pl. Sudan 3:399. 1956; Bor 101; Patel 91:312; Ch & O 245; S & J 52; S 304. *Andropogon serrulatus* A. Rich. Tent. Fl. Abyss. 2:458. 1851 (non Link 1827). *Andropogon prionodes* Steud. Syn. Pl. Glum. 1:383. 1854. *Arthraxon serrulatus* Hochst. in Flora 39:188. 1856; Blatter & McCann 75. t. 46. *Arthraxon lanceolatus* auct. non (Roxb.) Hochst. 1856; [illegible] 186.

Annual, tufted, [illegible]-45 cm tall, slender, straggling or decumbent, glabrous herbs. Leaves 3–4.7×0.6–0.7 cm, ovate-lanceolate, glabrous or nearly so. Racemes 3–7, 4–15 cm long, slender. Spikelets 0.3–0.5 cm long, laterally compressed.

Throughout, among other grasses.

FLS & FRS : Aug.–Nov.

Arthraxon quartinianus (A. Rich.) Nash in N. Amer. Fl. 17:99. 1912; Blatter & McCann 78. t. 49; Bor 102; Patel 91:312; Ch & O 246; S 304. *Alectoridia quartiniana* A. Rich. Tent. Fl. Abyss. 2:448. t. 99. 1851. *Arthraxon ciliaris* P. Beauv. subsp. *quartinianus* Hack. in DC. Mon. Phan. 6:356. 1889 (excl. var. *hookeri & glabrescens*).

Annuals, slender, glabrous or finely puberulous below the inflorescence, ascending from a prostrate, rooting base, 8–30 cm tall. Leaves 2–5×0.5–2 cm, flaccid, ovate-lanceolate to oblong-lanceolate, ciliate towards base. Racemes 1–9 in fascicles, 2.5–15 cm long. Spikelets solitary, sessile, oblong-lanceolate, somewhat obliquely laterally compressed.

Gujarat in dry places, often on old walls (Patel, 1965). Blatter & McCann (1935) cite Chamargaon as locality from Gujarat.

FLS & FRS : Sep.–Oct.

ARUNDINELLA Raddi

Key to species

1. Upper lemma not awned or if awned, awn not more than 0.2 cm long .. ..1. *leptochloa*

1. Upper lemma bearing a geniculate awn but without setae :
   2. Spikelets not more than 0.2 cm long; leaves elliptic-acuminate, membranous to chartaceous, 3-25×0.5-2.5 cm.. .. ..*A. pumila*
   2. Spikelets more than 0.2 cm long; leaves not as above .. ..*A. metzii*
1. Upper lemma with two setae, one on each side of the awn at tip :
   3. Perennials.. .. .. [illegible]hana .. ..*A. setosa*
   3. Annuals . .. .*A. tuberculata*

Arundinella leptochloa (Nees ex Steud.) Hk. f. in Hk. f. FBI 7:76. 1896; Bor 423; Patel 91:329; S & J 52. *Panicum leptochloa* Nees ex Steud. Syn. Pl. Glum. 1:62. 1854. *Arundinella gigantea* Dalz. in Dalz. & Gibs. Bombay Fl. 293. 1861; C 3:525; Blatter & McCann 197. t. 130.

Slender herbs, 30–60 cm tall. Leaves 6–13×0.3–0.6 cm., linear-lanceolate, glabrous. Panicles 7–15 cm long, with capillary branches. Spikelets 0.2–0.25 cm long, ovate-lanceolate, straw-coloured.

North Gujarat, Saurashtra and Kutch; not common.

FLS & FRS : Sep.–Nov.

Arundinella metzii Hochst. ex Miq. in Verh. Konink. Nederl. Inst. 3(4):31. 1851 & Anal. Bot. Ind. 2:19. 1851; C 3:523; Blatter & McCann 195; Bor 423; Patel 91:330; S 304. *Agrostis pygmaea* Hk. f. in Hk. f. FBI 7:72. 1896.

Perennials, tufted, erect, 40–45 cm tall, glabrous but for hairy nodes. Leaves 4–15 cm long, linear, flat, sparsely hairy. Panicles 15–40 cm long, decompound, pyramidal, with 4–15 cm long, erect, spike-like fascicled branches. Spikelets 0.25–0.3 cm long, paired distinctly pedicelled, ovate-lanceolate.

Throughout in moist places (except Kutch and Saurashtra); frequent. (DHUDU-GHAS, BAJJARIU)

FLS & FRS : Sep.–Nov.

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Arundinella pumila (Hochst.) Steud. Syn. Pl. Glum. 114. 1854; Bor 423; Patel 91:330; Ch & O 262; S 304. *Acratherum pumilum* Hochst. ex A. Rich. Tent. Fl. Abyss. 2:414. t. 100. 1851. *Arundinella tenella* Nees & Wt. ex Steud. Nom. (ed. 2) 1:143. 1840 & Syn. Pl. Glum. 1:115. 1854; FBI 7:71; C 3:522; Blatter & McCann 193.

15–40 cm tall, slender, erect, glabrous, herbs. Leaves 6–11 ×0.6–1.2 cm, ovate-lanceolate or linear-lanceolate, membranous, glabrous. Panicle 8–20 cm long, broadly ovate. Spikelets ± 0.1 cm long, delicately awned.

Throughout (except Kutch); Common.

FLS & FRS : Aug.–Nov.

Arundinella setosa Trin. Gram. Panic. 63.1826; FBI 7:70; C 3:521; Bor 424; Blatter & McCann 192. t. 126; Patel 91:330; S & J 53. *Arundinella capillaris* Hk. f. in Hk. f. FBI 7:74. 1896.

Caespitose, slender, glabrous, 30–60 cm tall herbs with thick, stoloniferous root-stocks. Leaves 15–30 × 0.3–0.6 cm, flat, very narrowly linear, glabrous or hairy. Panicles 9.5–25 cm long, with long, suberect, subsolitary or 2–4–nately whorled, 5–12.5 cm long branches. Spikelets 0.4–0.6 cm long, pedicellate, unequally paired, narrowly lanceolate or ovate–lanceolate.

Kutch and Saurashtra, in moist places.

FLS & FRS : Sep.–Nov.

Arundinella tuberculata Munro ex Lisboa in Journ. Bombay nat. Hist. Soc. 5:344. 1891; C 3:521; Bor 425; S & J 53.

Erect or slightly decumbent, glabrous, slender herbs, 30–45 cm tall. Leaves 2.5–9 × 0.4–1.3 cm, linear-lanceolate, hispid. Panicles 7–15 cm long, narrowly oblong, with 1.3–2.5 cm long, scabrulous branches. Spikelets 0.3–0.5 cm long (excluding awn), ovoid, solitary or geminate, clothed with bulbous hairs.

Saurashtra (*F. Albertson, 18036*).

FLS & FRS : Aug.

ARUNDO L.

Arundo donax L. Sp. Pl. 81. 1753; FBI 7:302; C 3:574; Blatter & McCann 204; Bor 413; Patel 91:329.

Stout herbs, 1.5–2.5 m tall, with fistular stem. Leaves 30–60 × 3–8 cm, linear–ensiform. Panicles stout, 30–45 cm long, erect. Spikelets 0.7–1 cm long, ovate–lanceolate.

Patel (1965) reports it to be common in south Gujarat, central Gujarat and north Gujarat in wet areas, but it has been seen by the present author only under cultivation. Blatter & McCann (1935) have also so reported

FLS & FRS : Nov.–Jan.

AVENA L.

Avena sterilis L. var. **culta**; Raizada in Ind. For. 80:36. 1954; Maheshwari, Fl. Delhi 399. 1963. *Avena sativa* auct non L. Sp. Pl. 79. 1753; Blatter & McCann 199; WI 1:138. Pl. 21(5); Bor 434; Patel 91:330.

An erect, 60–75 cm tall herb, with moderately stout, fistular, polished, glabrous stem. Leaves 30–45 × 1.5–2.5 cm, linear–lanceolate. Panicles terminal, open. Spikelets 2.5–3.3 × 0.4–0.5 cm, drooping.

Patel (1965) reports that this species is not cultivated in the State but is sometimes found growing with wheat. Sutaria (without number) collected it from dry mud of Sabarmati river near Ahmedabad. (OAT)

FLS & FRS : Dec.

BAMBUSA Schreb.

Bambusa arundinacea (Retz.) Willd. Sp. Pl. 2:245. 1799; FBI 7:395; C 3:569; Blatter & McCann 283. Holttum in Taxon 5:67. 1956; S & J 53; S 305. *Arundo bambos* L. Sp. Pl. 81. 1753 (nom. conf). *Bambos arundinacea* Retz. Obs. Bot 5:24. 1789. *Bambusa bambos* (L.) Voss in Vilm. Bluemeng. 1:1189. 1896.

Scanned by CamScanner

Thorny, tufted trees, 15–20 m tall; culm stout, 15–18 cm across. Leaves 18–20×2–2.5 cm, linear to linear-lanceolate, glabrous or puberulous beneath, scabrous on one or both margins, ciliate on round base. Panicle ample. Spikelets 1.3–2.5×0.4–0.5 cm, glabrous, suberect, lanceolate, in loose clusters.

In moist deciduous forests of Dangs (See also Blatter & McCann (1935) for locality in Gujarat). (KANTI VANS)

BOTHRIOCHLOA O. Ktze.

Key to species

1. Lower racemes longer than the rachis :
   2. Lower glume of sessile spikelet with one, rarely two pits.. .. ..*B. pertusa*
   2. Lower glume of sessile spikelet without pits..*B. ischaemum*
1. Lower racemes shorter than the rachis :
   3. Primary axis of the panicle mostly 3–7 (rarely 2 or upto 10) cm long; all branches of the panicle simple; racemes 3–7 cm long.. .. ..*B. intermedia*
   3. Primary axis of the panicle 5–10 cm long; all branches more or less divided; if undivided, very fine and naked upto 1.5 cm from base; racemes 2–5 cm long.. .. ..*B. glabra*

Bothriochloa glabra (Roxb.) A. Camus in Ann. Soc. Linn. Lyon, n. s. 76:164. 1931; Bor 107; Patel 91:312. *Andropogon glaber* Roxb. Fl. Ind. 1:271. 1820. *Amphilophis glabra* (Roxb.) Stapf in Prain, Fl. Trop. Afr. 9:172. 1917; Blatter & McCann 87(p. p.).

Perennial, stout, glabrous, tufted, erect or ascending from short rhizome, 75–100 cm tall herbs. Leaves 20–30×7–8.5 cm, linear, glabrous or sparsely pilose. Panicle 10–20×2.5–4 cm, narrowly oblong, erect, with whorled branches, bearing 1.2–3 cm long, inconspicuously white-villous racemes. Sessile spikelet pale-green to purplish, fertile, pedicelled spikelet neuter, mostly reduced to glume.

Patel (1965) lists it from Kutch (See also Thaker J. I. 1926, p. 286 under *Andropogon intermedius*) where it grows in open dry areas. (DHARFO)

FLS & FRS : Sep.

Bothriochlon intermedia (R. Br.) A. Camus in Ann. Soc. Lyon, n. s. 76:164. 1931; Bor 108; Patel 91:312; S & J 53; S 306. *Andropogon intermedius* R. Br. Prodr. 202. 1810; FBI 7:175; C 3:500. *Amphilophis intermedia* (R. Br.) Stapf in Agric. News, W. Ind. 15:179. 1916; Blatter & McCann 87 (p. p.).

Perennials, rhizomatous; culms erect or shortly geniculately ascending, 60–75 cm tall, with hairy nodes. Leaves 15–30×0.4–1 cm, linear, glabrous, ciliate towards base. Panicles 10–25 cm long, pyramidal or subcorymbose. Sessile spikelet 0.3–0.4 cm long, pale-green or purplish. Pedicelled spikelet 0.25–0.3 cm long, glabrous, neuter or much reduced.

From north to south Gujarat, common (See Patel, 1965). (DHARFO, SARAVU)

FLS & FRS : Aug.–Sep.

Bothriochloa ischaemum (L.) Keng in Contrib. Biol. Lab. Sci. Soc. China.Bot. (Ser. 10). 201. 1936; Bor 108; Patel 91:312. *Andropogon ischaemum* L. Sp. Pl. 1047. 1753.

Perennial herbs, with erect or geniculate, slender culms; nodes glabrous or bearded. Leaves mostly crowded at base, linear to linear-lanceolate. Racemes terminal, 2–7, up to 5 cm long. Sessile spikelets 0.45–0.5 cm long; lower glume of sessile spikelet 5-7-nerved, unpitted, with short, woolly hairs in lower three-quarters.

In scrub land in Kutch and Saurashtra (Patel, 1965; also listed by Thaker, J. I. from Kutch). (DUNGARI-ZENO, ZENZVO GHAS)

FLS & FRS : Aug.-Sep.

Scanned by CamScanner

Bethriochloa pertusa (L.) A. Camus in Ann. Soc. Linn. Lyon, (n. s.) 76:164. 1930 (1931); Bor 109; Patel 91:312; S & J 53. *Holcus pertusus* L. Mant. Alt. 2:301. 1771. *Andropogon pertusus* Willd. Sp. Pl. 4:922. 1806; FBI 7:173; C 3:497. *Amphilophis pertusa* Nash ex Stapf in Agri. News, W. Ind. 15:179. 1916 & in Fl. Trop. Afr. 9:175. 1917; Blatter & McCann 84. t. 86.

Perennial, 30–45 cm tall, tufted, erect or geniculately ascending herbs. Leaves 2.5–10 × 0.3–0.4 cm, flat, narrowly linear, scabrid on margins. Panicles subdigitate, of 3–8 racemes; racemes 3–7.5 cm long, slender, silky-hairy. Spikelets 0.3–0.35 cm long, sessile one female, pedicellate one male or neuter.

Throughout, common. (ZENZVO, JINJVO).

FLS & FRS : July–Jan.

BRACHIARIA Griseb.

Key to species

1. Rachis more or less flat, herbaceous, sometimes ribbon-like .. ..*B. mutica*
1. Rachis triquetrous, sometimes filiform :
   2. Panicle linear with erect racemes of closely crowded, softly hairy spikelets; lower glume reduced to a minute scale 0.3 mm long.. .. ..*B. eruciformis*
   2. Panicle various, oblong, lanceolate or spreading; lower glume up to half as long as the spikelets :
      3. Spikelets upto 2·mm long.. .. .. ..*B. reptans*
      3. Spikelets 2.5–4.5 mm long or longer :
         4. Spikelets turgid .. ..*B. ramosa*
         4. Spikelets not turgid, if turgid, rachis not triquetrous:
            5. Spikelets ovate to lanceolate, paired in the lower part of racemes.. .. .. ..*B. setigera*
            5 Spikelets elliptic, oblong to obovate, usually arranged singly on the rachis; occasionally spikelets paired at base of racemes.. ..*B. distachya*

Brachiaria distachya (L.) Stapf inP rain, Fl. Trop. Afr. 9:565. 1919; Bor 281; Patel 91:321. *Panicum distachyon* L. Mant. 1:38. 1767; FBI 7:37.

A slender herb, 30–60 cm high, glabrous but for hairy nodes. Leaves 5–9 × 0.8–1 cm, erect or spreading, linear-lanceolate. Spikes 2–4, 3–5 cm long, erect, at length spreading. Spikelets elliptic-obovate, glabrous, solitary.

Rare in Gujarat (except Kutch and Saurashtra).

FLS & FRS : Aug.–Sept.

Brachiaria eruciformis (J. E. Sm.) Griseb. in Ledeb. Fl. Ross. 4:469. 1853; Bor 283; Patel 91:321; S & J 53; S 306. *Panicum eruciforme* J. E. Sm. in Sibth et J. E. Sm. Fl. Graeca 1:44. t. 59. 1806. *Panicum isachne* Roth ex R. & S. Syst. Veg. 2:458. 1817; FBI 7:28; C 3:448. *Brachiaria isachne* Stapf in Fl. Trop. Afr. 9:552. 1919; Blatter & McCann 133. t. 85.

Annual herbs, 15–30 cm tall, tufted, suberect or geniculately ascending. Leaves 2.5–7 × 0.15–0.4 cm, flat, lanceolate, appressed-hairy. Panicles 6–7.5 cm long, of 6–8, secund or subsecund, racemosely arranged spikes; spikes 1–3 cm long, sessile or shortly pedicellate.

Throughout (except Kutch).

FLS & FRS : Aug.–Feb.

Brachiaria mutica (Forsk.) Stapf in Prain, Fl. Trop. Afr. 9:526. 1919; Blatter & McCann 134; Bor 284; Patel 91:322. *Panicum muticum* Forsk. Fl. Aegpt.-Arab. 20. 1775; FBI 7:34; C 3:456.

1–2.5 m tall, stout, simple or sparingly branched perennials, ascending from prostrate and copiously branched rooting base. Leaves 22–30 × 0.4–1 cm, glabrous or hirsute, scabrid on margins. Panicles oblong or ovate-oblong, subsecund, 6–20 cm long. Racemes numerous, solitary, paired or falsely whorled, subsessile or peduncled, 2–2.5 cm long. Spikelets 0.3–0.4 cm long, oblong or oblong-lanceolate, glabrous.

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Cultivated at some places (Patel, 1965). Blatter & McCann (1935) cite loc. Surat. (PARAGHAS)

FLS & FRS : Aug.-Jan.

Brachiaria ramosa (L.) Stapf in Prain, Fl. Trop. Afr. 9:542. 1919; Blatter & McCann 134. t. 86; Bor 284; Patel 91:312; S & J 52: S 306. *Panicum ramosum* L. Mant. Pl. 1:29. 1767; FBI 7:36 (p. p.); C 3:449.

Annual, slender herbs, 30–45 cm tall, tufted. Leaves 3–9.3 ×0.4–1 cm, linear-lanceolate, flat, glabrous or sparsely hairy. Panicles 5–10 cm long; spikes 5–13, 1.2–3.7 cm long, distant, subracemose. Spikelets 0.3–0.5 cm long, ovoid, obovoid or elliptic, close or distant, solitary or paired, at length pale-brown.

Throughout, everywhere; common.

FLS & FRS : July–Nov.

Brachiaria reptans (L.) Gard. & C. E. Hubb. in Hk. Icones Pl. sub tab. 3363. 1938; Bor 285; Patel 91:322; S & J 53. *Panicum reptans* L. Syst. Nat. (ed. 10) 870. 1759. *Panicum prostratum* Lam. Tab. Encycl. Meth. Bot. 1:171. 1791 & Encycl. Meth. Bot. 4:730. 1797; FBI 7:33; C 3:448. *Urochloa reptans* (L.) Stapf in Prain, Fl. Trop. Afr. 9:501, 1920; Blatter & McCann 144. t. 92.

Slender annuals, 20–30 cm tall, tufted, with a creeping base. Leaves 3–6×0.2–1 cm, linear-lanceolate, flat, glabrous. Panicles 5–7 cm long; spikes 2.5–3 cm long; spikelets 0.15–0.2 cm long, ovoid to ovate-lanceolate, glabrous.

Throughout (excl. Kutch); not common. (KANERU, PANERU, DADHIYO)

FLS & FRS : Aug.-Sep.

Brachiaria setigera (Retz.) Hubb. in Hk. Ic. Pl. 34:2. Pl. sub tab. 3363. 1938; Bor 286; Patel 91 : 322; S & J 53. *Panicum setigerum* Retz. Obs. 4:15. 1786; FBI 7:37; C 3:449. *Urochloa setigera* (Retz.) Stapf in Prain, Fl. Trop. Afr. 9:598. 1920; Blatter & McCann 45.

60–90 cm long, slender herbs, prostrate or widely straggling below, bearded at nodes. Leaves 7.5–12.5×1–2.2 cm, ovate-lanceolate, flat, more or less ciliate at base. Panicles of 3–10, 2.5–5 cm long racemes, lower distant, alternate. Spikelets 2.5–3 cm long, loosely imbricate, 2-seriate, secund, ovoid, glabrous or pubescent, acute to acuminate.

Throughout. (KANERU, PANERU)

FLS & FRS : Aug.–Sep.

CAPILLIPEDIUM Stapf

Key to species

1. Culms weak, decumbent or trailing, much geniculately branched.. .. ..*C. filiculme*
1. Culms erect, robust, simple or branched :
   2. Lower glume of the sessile spikelet channelled; leaves slightly narrowed at base; panicle large, diffuse, of small spikelets.. .. .. *C. parviflorum*
   2. Lower glume of the sessile spikelet flat on the back; leaves conspicuous narrowed at base; panicle often dense, of few to many spikelets :
      3. Nodes glabrous or shortly hairy; callus shortly bearded; panicle often somewhat open .. .. .. *C. assimile*
      3. Nodes densely bearded; callus villously bearded; panicles contracted.. .. ..*C.. hugelii*

Capillipedium assimile (Steud). A. Camus in Lecomte, Fl. Gen. de l' Indo-Chine 7:314. 1922; Blatter & McCann 80. t. 51; Bor 110; Patel 91:312. *Andropogon assimilis* Steud. in Zoll. Syst. Verz. 58. 1854; FBI 7:179; C 3:501.

Fastigiately branched, 30–45 cm tall, stout, polished herbs. Leaves 5–15 × 0.3–0.6 cm, linear-lanceolate, glabrous or nearly so. Inflorescence lax panicles with capillary branches. Spikelets 0.3–0.5 cm long, ovoid-oblong.

Scanned by CamScanner

South Gujarat, growing in shady ground (Patel 1965).

FLS & FRS : Aug.– Oct.

Capillipedium filiculme (Hk.f.) Stapf in Hk. Icon. t. 3035. 1922; Blatter & McCann 82; Bor 111; Patel 91:312; Ch & O 246. S & J 53; S 306. *Andropogon filiculmis* Hk.f. in Hk.f. FBI 7:181. 1896; C 3:502.

Annual, prostrate herbs, geniculately much branched from decumbent base. Leaves linear-lanceolate, glabrous or nearly so. Panicles lax, 4–6 cm long, on capillary rachis; spikelets 0.3–0.4 cm long, pale-green or almost white, distant on rachis, upper ones pedicellate, awnless, lower ones sessile, oblong-lanceolate, with densely villous callus.

Throughout (except Saurashtra and Kutch) in plains and hills.

FLS & FRS : Aug.– Dec.

Capillipedium hugelii (Hack.) Stapf in Hk. Ic. Pl. sub. tab. 3085. 1922; Blatter & McCann 81. t. 52; Bor 111; Patel 91: 313; S 306. *Andropogon hugelii* Hack. in DC. Mon. Phan. 6:492. 1889; FBI 7:180; C 3:501.

45–60 cm tall, glabrous herbs, with creeping base, rooting at nodes. Leaves 8–30×0.4–1 cm, linear-lanceolate, flat, shortly ciliate on margins. Panicles 3–12 cm long, terminal. Spikelets 0.25–3 cm long, ovate, glabrous or villous below middle.

South Gujarat in forest undergrowth and in stony ground, on rocks and rock crevices in river beds; common.

FLS & FRS : Aug.– Dec.

Capillipedium parviflorum (R. Br.) Stapf in Prain, Fl. Trop. Afr. 9:169. 1917; Bor 112. *Holcus parviflorus* R. Br. Prodr. 199. 1810.

Tufted, geniculately ascending, 60–100 cm tall, rather stout herbs, glabrous but for bearded nodes. Leaves 15–30×0.5–1 cm, flat, linear-lanceolate, tubercled hairy. Panicle 5–20 cm long,

decompound, effuse, oblong or narrowly pyramidal; primary branches unequal, 2–4-clustered. Sessile spikelet 0.2–0.3 cm long, linear-oblong to elliptic-oblong; pedicelled spikelet as long as sessile spikelet with pedicel about two-thirds to four-fifths as long as spikelet.

Dangs (WTS 2715). The specimen is in the Gujarat College Herbarium, Ahmedabad.

FLS & FRS : Nov.

CENCHRUS L.

Key to species

1. Bristles or spines of the involucre antrorsely scabrid :
   2. Bristles connate at base only.. .. .. ..*C. ciliaris*
   2. Bristles connate into a cup 0.1–0.3 cm long :
      3. Inner bristles very slender, widened into a cup at the base, tapering into a setiform tip; outer bristles numerous, slender.. .. ..*C.. pennisetiformis*
      3. Inner bristles rigid, flattened and subulate, acute at tip, not drawn out; outer bristles few or absent.. .. ..*C. setigerus*
1. Bristles or spines of the involucre retrosely scabrid..*C. biflorus*

Cenchrus biflorus Roxb. Fl. Ind. 1:238. 1820; Bor 287; Patel 91:322; S & J 53. *Cenchrus catharticus* Del. Cat. Hort. Monsp. 1838 : 4. 1839 & in Linnaea 13:103. 1839; FBI 7:90; C 3:433; Blatter & McCann 186. t. 110.

30–40 cm tall, tufted, glabrous herbs. Leaves 6–18×0.3–0.7 cm, flat, linear-lanceolate, glabrous. Spikes 5–15 cm long, solitary, terminal, at first pale-green, later on straw-coloured, often light- to dark-violet or almost black.

Throughout, a troublesome weed, often gregarious; common. (MOTU-DHRAMNU)

FLS & FRS : July–Dec.

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Cenchrus ciliaris L. Mant. Alt. 302. 1771; WI 2:115. t. 54; Bor 287. f. 33; Patel 91:322; Ch & O 255; S & J 53. *Pennisetum cenchroides* Rich. in Pers. Syn. 1:72. 1805; FBI 7:88; C 3:432. *Pennisetum ciliare* (L.) Link, Hort. Berol. 1:213. 1827; Blatter & McCann 181. t. 116.

Slender, perennial herbs, 40–50 cm tall, tufted. Leaves 10–25×0.5–0.8 cm, linear-lanceolate, glabrous. Spikes 6–10 cm long, terminal, solitary, at first green, then pale-brown and at times pale- to deep violet. Spikelets 0.4–0.6 cm long, oblong-lanceolate or subglobose.

Throughout, everywhere; common. (ANJAN, DHAMAN, JHINU DHAMNU)

FLS & FRS : July-Jan.

Cenchrus pennisetiformis Hochst. & Steud. ex Steud. Syn. Pl. Glum. 1:109. 1854; Bor 289; S & J 53. *Pennisetum cenchroides* Rich. var. *echinoides* Hk. f. in Hk. f. FBI 7:88. 1896.

Perennial tufted, 30–50 cm tall, glabrous herbs. Leaves 5–20×0.2–0.4 cm, narrowly linear-lanceolate, finely acuminate, sparsely hairy to nearly glabrous. Racemes 4–15 cm long, solitary, terminal. Spikelets 0.6–0.8 cm long (including bristles), glabrous.

Common (in north Gujarat) often in small patches along hedges and road sides and in open grasslands.

FLS & FRS : Aug.–Oct.

Cenchrus setigerus Vahl, Enum. Pl. 2:395. 1806; Bor 290; Patel 91:322; Ch & O 255; S & J 53. *Cenchrus biflorus* auct. non Roxb. 1820; FBI 7:89; C 3:433; Blatter & McCann 185. t. 118.

Annual, tufted, erect or spreading, glabrous herbs, 30–45 cm tall. Leaves 10–25×0.2–0.7 cm, linear-lanceolate, finely acuminate, somewhat scabrid-hairy. Racemes 5–10 cm long, solitary, terminal, turning violet-purple to almost black at maturity. Spikelets 0.4–0.5 cm long, ovate-oblong, 2-flowered.

Throughout, a common weed. (DHARAMNU, DHAMNU, DHAMAN-GHAS)

FLS & FRS : July-Sep.

CHIONACHNE R. Br.

Chionachne koenigii (Spr.) Thw. Enum. Pl. Zeyl. 357. 1864; Bor 262; Patel 91:320; Ch & O 239; S & J 53; S 306. *Coix koenigii* Spr. Syst. 1:239. 1825. *Chionachne barbata* (Roxb.) R. Br. in Benn. Pl. Jav. Rar. 18. 1838. *Polytoca barbata* (Roxb.) Stapf in Hk. f. FBI 7:102. 1896; C 3:519; Blatter & McCann 6. t. 3.

Perennial, monoecious herbs, 1–1.6 m tall, robust, erect. Leaves 8–40×0.6–2 cm, flat, linear, hairy. Racemes 2–4 cm long, on slender peduncles, male spikelets above 0.7–0.9 cm long, female spikelet solitary below, 0.4–0.6 cm long; spathiform sheath 1–2.5 cm long, glabrous, awned.

In wet lands (except Kutch). (GAROLU)

FLS & FRS : Sep.–Oct.

CHLORIS Sw.

Key to species

1. Lemma with a row of glands or tubercles on each side of the mid-rib .. ..*C. prieurii*
1. Lemma without such glands or tubercles :
   2. Empty lemmas above the fertile floret solitary, well developed or rudimentary :
      3. Spikes usually long (upto 25 cm long), widely spreading; upper glume 0.5–0.75 cm long; empty lemma represented by a fine awn upto 1.25 cm long; plants erect from the base .. ..*C. dolichostachya*
      3. Spikes not more than 6.5 cm long, closely crowded; upper glume 0.3–0.35 cm long, aristulate; empty lemma oblanceolate, truncate with an arista 0.4 cm or more long; stem prostrate, rooting at nodes and sending up flowering culms .. ..*C. virgata*

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2. Empty lemmas above the lowest two to four :
   4. Culms glabrous below the inflorescence :
      5. Perennials; spikelets cuneate with four or five awns; second lemma very similar to the lowest but smaller .. ..*C. montana*
      5. Annuals; spikelets plump, with three, rarely four awns; second lemma of thinner texture than the lowest, much smaller, truncate, obovate, eventually globose.. .. ..*C. barbata*
   4. Culms puberulous below the inflorescence. .. ..*C. quinquesetica*

Chloris barbata Sw. Fl. Ind. Occ. 1:200. 1797; FBI 7:292; C 3:555; Blatter & McCann 256. t. 171; Bor 465; Patel 91:330; S & J 53. *Andropogon barbatus* L. Mant. Pl. Alt. 302. 1771 non L. 1759. *Chloris inflata* Link, Enum. Pl. Hort. Berol 1:105. 1821; WI 2:130. For a nomenclatural discussion see Bor (1965).

30–50 cm tall, tufted, perennial herbs, with a creeping base. Leaves 2–6 cm long, flat, linear, glabrous. Spikes 5–12, 2–6 cm long, violet-purple, on drying pale-straw, digitate. Spikelets 0.2–0.25 cm long, arranged in rows, unilateral on axis.

Throughout, common. (MINDADIU)

FLS & FRS : July–Apr.

Chloris dolichostachya Lagas. Gen. & Sp. Pl. 5.1816; Bor 466; Patel 91:331; Ch & O 261; S & J 53. *Chloris incompleta* Roth, Nov. Pl. Sp. 60. 1821; FBI 7:290; C 3:556; Blatter & McCann 253. t. 168.

Perennial, erect or procumbent and then geniculate, glabrous herbs. Leaves 10–20×0.3–0.6 cm, narrowly linear, finely acuminate, glabrous. Inflorescence of generally 5(–4) digitately arranged, 10–20 cm long, spreading spikes forming a terminal whorl. Spikelets 0.4–0.5×0.1–0.15 cm, imbricated, two rowed, awned, oblanceolate, closely appressed to the axis.

In many parts (except Kutch). (SILARIU, RANI-SIKRIYO)

FLS & FRS : Oct.–Dec.

Chloris montana Roxb. Hort. Beng. 82.1814 (nomen) & Fl. Ind. 1:331. 1820; FBI 7:292; Blatter & McCann 257; Bor 466; Patel 91:331; S & J 52.

Perennial, tufted, 30–45 cm tall herbs. Leaves 4–11 cm long, flat, sometimes folded, linear. Spikes 8–10, 2.5–5.5 cm long, digitately arranged, terminal. Spikelets about 0.2 cm long, at length purplish, arranged unilaterally in row.

Saurashtra.

FLS & FRS : Aug.–Jan.

Chloris prieurii Kunth, Rev. Gram. 2:441. t. 134. 1831; Bor 466; Patel 91:331.

Listed by Patel (1965) from sandy areas in north Gujarat.

FLS & FRS : Oct.–Dec.

Chloris quinquesetica Bhide in Journ. Proc. As. Soc. Beng. n. s. 8:311. 1812; Blatter & McCann 257; Bor 466; Patel 91:331; S & J 52.

Perennial herbs, 30–45 cm tall, erect, creeping and rooting at lower nodes. Leaves 8–10 cm long, lanceolate, scabridly hairy on margins. Spikes 2.5–5 cm long, terminal, crowded into subracemose fascicles. Spikelets 0.6–0.75 cm long, including awn.

Kutch and Saurashtra; not common.

FLS & FRS : Sep.–Dec.

Chloris virgata Sw. Fl. Ind. Occ. 1:203. 1797; FBI 7:291; Blatter & McCann 255. t. 170; WI 2:131; Bor 468; Patel 91:331; Ch & O 261; S & J 53.

Erect or geniculately ascending herbs, creeping and rooting at nodes towards base. Leaves 10–25×0.3–0.5 cm, flat, linear,

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glabrous at length. Spikes 5–15, 3.5–6 cm long, digitately arranged. Spikelets 0.2–0.25 cm long, ovate-lanceolate, unilateral, in two rows on rachis.

Throughout; common.

FLS & FRS : July–Dec.

CHRYSOPOGON Trin. nom. cons.

Key to species

1. Pedicels half the length of the sessile spikelets or longer .. .. *C. aciculatus*
1. Pedicels shorter than half the length of the sessile spikelets :
   2. Leaves puberulous.. .. .. *C. aucheri*
   2. Leaves glabrous, occasionally with a few tubercle based hairs, not puberulous :
      3. Leaves conspicuously distichous.. .. *C. polyphyllus*
      3. Leaves not distichous :
         4. Upper glume of the sessile spikelet on the back keeled. pectinate–ciliate in the lower two-thirds or three quarters with long, golden or golden–brown, rigid hairs.. .. .. *C. fulvus*
         4. Upper glume of the sessile spikelet glabrous on the back or shortly ciliate in the upper quarter only .. .. *C. serrulatus*

Chrysopogon aciculatus (Retz.) Trin. Fund. Agrost 188. 1820; Blatter & McCann 68; Bor 115; Patel 91:313. *Andropogon aciculatus* Retz. Obs. Bot. 5:22. 1789; FBI 7:188; C 3:504.

An erect or ascending, 30–50 cm tall, perennial herb, with a woody, creeping rhizome. Leaves densely tufted, 2–10×0.3-0.7 cm., linear to linear–lanceolate, spinulose on margins. Panicles erect, pale-green or purplish, narrow, 2.5–8 cm long, with filiform branches. Spikelets in 3, awned, sessile, 0.3-0.4 cm long, pedicellate slightly longer.

Common along sea coast in south Gujarat–Surat district (Patel 1965).

FLS & FRS : Aug.

Chrysopogon aucheri (Boiss.) Stapf in Kew Bull. 1907:21. 1907; Blatter & McCann 73; Bor 116; Patel 91:313; S & J 54. *Andropogon aucheri* Boiss. Diag. Ser. 1. 5:77. 1844; FBI 7:195; C 3:505.

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Densely tufted, 15-45 cm tall, simple or sparingly branched, glabrous herbs. Leaves 5-10×0.2-0.4 cm, linear, more or less pubescent, often ciliate near base. Panicle 5–7.5 cm long, of 4–6 whorled branches. Sessile spikelets ovate–lanceolate, 0.5–0.6 cm long, with a short callus. Pedicellate spikelet slightly longer than sessile spikelet, linear–lanceolate.

Kutch and Saurashtra.

FLS & FRS : Aug.–Sept.

Chrysopogon fulvus (Spr.) Chiov. Fl. Somal. 1:327. 1929; Bor 116; Patel 91:313; Ch & O 244; S & J 54; S 307. *Pollinia fulva* Spr. Pugill. 2:10. 1815. *Andropogon montanus* Koen. ex Trin. in Spr. Neue Entdeck. 2:93. 1821. *Andropogon monticola* R. & S. Syst. Veg. 2. Mant. 665. 1827; FBI 7:192; C 3:505. *Cyrysopogon montanus* Trin. ex Spreng. Neue Entdeck. 2:93. 1821; Blatter & McCann 70. t. 42. *Chrysopogon monticola* (R. & S.) Haines in Indian For. 40:495. 1914.

Perennial, 30–50 cm tall, slender, tufted, basally geniculate herbs. Leaves 3-6.5 cm long, narrowly linear, glabrous but for scabrulous, thickened margins. Panicles 6–10 cm long, terminal, open. Spikelets bright–yellow.

Throughout, everwhere; common (DRAF, KHAD-SUNDHIU, KHARALU).

FLS & FRS : Sep.–Jan.

Chrysopogon polyphyllus (Hack. ex Hk. f.) Blatter & McCann in Journ. Bombay nat. Hist. Soc. 32:416. 1928 & Bombay Grasses 72. 1935. Bor 118; Patel 91:313; S & J 54. *Andropogon polyphyllus* Hack. ex Hk. f. in Hk. f. FBI 7:194. 1896.

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60–90 cm tall, robust, simple or fastigiately branched, glabrous herbs. Leaves crowded or not, 15-25×0.2-0.4 cm, narrowly linear, flat, rigid, glabrous. Panicles 10–13 cm long, oblong, subsecund, dense flowered, very pale. Sessile spikelets ± 0.4 cm long, drooping, white or pale-purplish.

Throughout (except Kutch) in shaded spots.

FLS & FRS : Aug.–Oct.

Chrysopogon serrulatus Trin. in Mem. Acad. Sci. Petersb. (Ser. 6) 2:318. 1832; Bor 118. *Andropogon monticola* Schult. var. *trinii* Hk. f. in Hk. f. FBI 7:193. 1896. *Chyrysopogon montanus* Trin. var. *serrulatus* (Trin.) Stapf in Prain, Fl. Trop. Afr. 9:160. 1917 (in obs.); Blatter & McCann 70; WI 2:151.

Perennial herbs, 30–45 cm tall, slender, simple or branched. Leaves 6–10×0.2–0.4 cm, linear, flat, serrulate on margins. Panicles 8–12 cm long, terminal, open or contracted. Spikelets bright-yellow, 0.4–0.6 cm long, glabrous or puberulous.

South Gujarat (Dangs and Rajpipla), common in rocky river beds.

FLS & FRS : Oct.–Jan.

CLEISTACHNE Bth.

Cleistachne sorghoides Bth. in Hook. IC. Pl. 14. t. 1379. 1882; Bor 119.

This species was collected by Shah (13071) from Dediapada-Rajpipla forest division.

FLS & FRS : Dec.

COIX L.

Coix lachryma-jobi L. Sp. Pl. 972. 1753; FBI 7:100; C 3:517; Blatter & McCann 3. t. 1; WI 2:305. t. 115; Bor 264; Patel 91: 321; S & J 54; S 307. *Coix lachryma* L. Syst. Nat. (ed. 10) 1261 1759.

120–180 cm tall, stout, erect herbs, rooting at lower nodes. Leaves 12–45×6.8–2 cm, flat, liner-lanceolate, glabrous or sparsely hairy. Inflorescence axillary and terminal, of spike-like racemes; male spikelets above, 2–3-nate, 0.8–1.2 cm long, female below, 0.8–1 cm long, ovoid or globose, enclosed in creamy or bluish-grey, polished, hardened bract.

Throughout, in moist places; common to rare in areas of occurrence. (KAHUDO, KASAI)

FLS & FRS : Aug.–Dec.

CRYPSIS Ait. nom. cons.

Crypsis schoenoides (L.) Lam. Tab. Encycl. Meth. Bot. 1:166. t. 42. 1791; Bor 622; Patel 91:337; S & J 54. *Phleum schoenoides* L. Sp. Pl. 60. 1753. *Heleochloa schoenoides* (L.) Host, Icon. Gram. Austr. 1:23. t. 30. 1801; FBI 7:235; C 3:532; Blatter & McCann 205. t. 133.

Prostrate, radially spreading, glabrescent herbs, with 5–8 cm long branches. Leaves 2–5 cm long, stiff, narrowly linear-lanceolate, sparsely hairy. Inflorescence spicate, ovoid-oblong, compressed. Spikelets 0.2–0.3 cm long, compressed, imbricate.

Saurashtra, north Gujarat, Rajpipla and Broach; rare.

FLS & FRS : July–Mar.

CYMBOPOGON Spr.

Key to species

1. Sessile spikelet without an awn.. .. .. ..*C. citratus*
1. Sessile spikelet awned :
   2. Panicles narrow, of short, dense fascicles of raceme pairs; joints and pedicels villous all over; hairs long, concealing the sessile spikelets :
      3. Lower glume of the sessile spikelets pubescent in the groove; pedicel of the lowest pedicelled spikelet in the subsessile raceme swollen, hard, shining of hairy; basal sheaths woolly; pedicelled spikelet hairy on nerves .. ..*C. parkeri*

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3. Lower glume of the sessile spikelet glabrous; pedicel of the lowest pedicelled spikelet not enlarged; basal sheaths not woolly; pedicelled spikelet glabrous :

4. Leaf blades more or less filiform and flexuous; sheaths widened and thickened below, the old ones never curled in a spiral.. .. ..*C. schoenanthus*

4. Leaf blades flat; basal sheaths when old slipping from the culm and becoming curled in a characteristic spiral :

5. Leaf blades 0.5 cm broad.. ..*C. jwarancusa*

5. Leaf blades 0.2 cm broad.. .. ..*C. olivieri*

2. Panicles often large, compound or decompound, drooping, sometimes narrow, but then hairs not covering the joints and pedicels :

6. Lower glume of the sessile spikelet with a deep slot-like depression occupying most of its length .. ..*C. gidarba*

6. Lower glume of the sessile spikelet without a slot, either flat, convex, shallowly concave or with a deep narrow slit in the lower half :

7. Leaves cordate and amplexicaul at base, linear-lanceolate to lanceolate.. .. ..*C. martinii*

7. Leaves linear-acuminate, not cordate but narrow and rounded at base.. .. .. ..*C. caesius*

Cymbopogon caesius (Nees) Stapf in Kew Bull. 1906: 341 & 360. 1906; Blatter & McCann 105; Bor 125; Patel 91:313. *Andropogon caesius* Nees in Wt. Cat. Nos. 1700a & 1700b. 1833 (nomen) ex Hk. & Arn. Bot. Beech. Voy. 244. 1838 (descr.) *Andropogon schoenanthus* L. subsp. *genuinus* var. *caesius* Hack. in DC. Mon. Phan. 6:610. 1889; FBI 7:205. *Andropogon schoenanthus* L. var. *gracillimus* Hk.f. in Hk.f. FBI 7:205. 1896.

Perennial herbs, 60–100 cm tall, tufted, slender, erect or basally geniculate. Leaves 6–10 cm long, flat, linear, glabrous. Racemes 10–15 cm long, terminal, spathaceous. Spikelets reddish-brown, glabrous, 0.4–0.5 cm long, linear-lanceolate.

South and north Gujarat: in the latter area it is found on sandy and gravelly hills at Prantij and Ahmedadad.

FLS & FRS : Sept.–Dec.

Cymbopogn citratus (DC.) Stapf in Kew Bull. 1906:357. 1906; Blatter & McCann 130; Bor 126; Patel 91:313; S & J 54. *Andropogon citratus* DC. Cat. Hort. Monsp. 78.1813. *Andropogon schoenanthus* auct. non L. 1753; FBI 7:204; C 3:511.

Tall, perennial herbs, throwing dense fascicles of leaves from a short, oblique rhizome. Leaves 45–150×1.6–1.8 cm, glaucous-green, rough along margins.

This is the common "lemon grass" used to flavour tea decoction. Cultivated at some places. (LILI CHAHA)

FLS & FRS : Not seen.

Cymbopogon gidarba (Ham. ex Hk. f.) Haines, Bot. Bihar & Orissa 1048. 1924; Bor 128. *Andropogon gidarba* Ham. ex Hk. f. in Hk. f. FBI 7:208. 1896.

10–40 cm tall, annual, tufted herbs. Leaves 3–8×0.2–0.3 cm, linear, flat, glabrous. Spikes 2.5–3 cm long, culminating into 8–15 cm long, terminal, interrupted racemes.

Broach and Rajpipla; rare.

FLS & FRS : Dec.–Apr.

Cymbopogon jwarancusa (Jones) Schult. Mant. 2:458. 1824; Blatter & McCann 102; Bor 128; Patel 91:313. *Andropogon jwarancusa* Jones in As. Res. 4:109. 1795; C 3:495. *Andropogon jwarancusa* Jones subsp. *jwarancusa*; FBI 7:203.

Tall grass upto 1.8 m high, with aromatic roots, densely tufted. Leaves 45–60×0.4–0.8 cm, flat, narrowly linear. Panicle large and narrow, interrupted with very compressed, short fascicled, spatheate branches. Racemes 1.4–1.8 cm long. Spikelets 3–4 pairs, green, half-hidden by 0.5 cm long villi on joints and pedicels. Sessile spikelet 0.5 cm long, pedicelled spikelet equal to or rather larger than sessile one, narrowly lanceolate.

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"In sandy soils of Kutch" Gujarat (Patel, 1965); Cooke cites loc. Ahmedabad.

FLS & FRS : Aug.–Sep.

Cymbopogon martinii (Roxb.) Wats. in Atkins. Gaz. N. W. Prov. Ind. 392. 1682; Blatter & McCann 104; WI 2:416. f. 159; Bor 129; Ch & O 248; S & J 54; S 307. *Andropogon martinii* Roxb. Fl. Ind. 1:280. 1820. *Andropogon schoenanthus* L. var. *martinii* (Roxb.) Hk. f. in Hk. f. FBI 7:204. 1896.

Sweet-scented, perennial herbs, 90–100 cm tall. Leaves 15-25 × 0.8–1.2 cm, linear-lanceolate or ovate-lanceolate, glabrous but for scabrid margins. Spikes 2.5–5 cm long, spathaceous, in 10-25 cm long, terminal, interrupted racemes. Spikelets 0.3–0.4 cm long.

Throughout, in hilly areas, gregarious; common. (ROICHA GHAS, ROSHA GHAS).

FLS & FRS : Aug.–Dec.

Cymbopogon oliveri (Boiss.) Bor in Notes Roy. Bot. Gard. Edin. 25:62. 1963 & in Fl. Iran. 9:518. 1968; Jain & Das in Indian For. 99: 570. 1973. *Andropogon oliveri* Boiss. Diagn. Fl. Orient. Nov. (Ser. I) 5:76. 1844. *Cymbopogon schoenanthus* Guest in Dep. Agr. Iraq. Bull. 27:27. 1933 (non Spr. Pl. Pugill. 2:15. 1815). *Andropogon laniger* Boiss. in Fl. Orient. 5:465. 1884 non Desf. 1799. *Andropogon jwarancusa* Jones subsp. *laniger* (Desf.) Hk. f in Hk.f. FBI 7:203. 1896.

Perennial herbs, with tufted, erect or basally geniculate, polished culms. Leaves 6–17 × 0.2–0.3 cm, linear, glabrous. Racemes 7-18 cm long, terminal, interrupted, spathaceous. Spikelets greenish-brown to deep-reddish-brown.

Chhotaudepur forest division (Kawant), in a cultivated field; rare.

FLS & FRS : Dec.

Cymbopogon parkeri Stapf in Kew Bull. 1929: 10. 1929; Bor 131; S & J 54.

1–1.2 m tall, erect, basally tufted herbs, with glabrous culms. Leaves 25–30 × 0.5–1 cm, linear to linear-lanceolate, glabrous. Panicles 6–10 cm long.

Saurashtra (Paneli-vidi, Morvi, *Bole* 911).

FLS & FRS : Oct.

Cymbopogon schoenanthus (L.) Spr. Pugill. 2:15. 1815; Blatter & McCann 101..t. 66; Bor 131; Patel 91:314; S & J 54. *Andropogon schoenanthus* L. Sp. Pl. 1046. 1753.

Perennial herbs upto 1 m tall, tufted, slender, erect. Leaves 6–18 × 0.3–0.6 cm, linear, glabrous. Racemes 7–20 cm long, terminal, dense or interrupted, spathaceous. Spikelets greenish-to deep-reddish-brown.

North to south Gujarat; not common. (ROSHDO)

FLS & FRS : July–Dec.

CYNODON A. Rich. nom. cons.

Key to species

1. Plants rhizomatous; hairs on lemma not clavellate; lemma longer than the upper glume.. .. .. ..*C. dactylon*
1. Plants not rhizomatous; hairs on lemma clavellate; lemma equal to or shorter or slightly longer than the upper glume .. ..*C. barberi*

Cynodon barberi Rang. et Tad. in Journ. Bombay nat. Hist. Soc. 24:846. 1916; Bor 469.

This species differs from *Cynodon dactylon* Pers. in absence of stoloniferous underground branches, short leaves, upper glume always equal to or longer than lemma and presence of clavellate hairs on keels and margins of lemma and on keels of palea.

South Gujarat (Rajpipla); rare.

FLS & FRS : Aug.–Oct.

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Cynodon dactylon (L.) Pers. Syn. Pl. 1:85. 1805; FBI 7:288; C 3:554; Blatter & McCann 250. t. 166; WI 2:420. t. 151; Bor 469. t. 52; Patel 91:331; Ch & O 261; S & J 54; S 307. *Panicum dactylon* L. Sp. Pl. 58. 1753.

Perennial creeping herbs with slender erect, 10–30 cm tall culms. Leaves 2–6.5 cm long, narrowly linear or lanceolate, flat. Spikes 2–5, 1.5–6.2 cm long, digitate, spreading or recurved. Spikelets sessile, laterally compressed and densely imbricating, greenish.

Throughout; common. (DARBH)

FLS & FRS : Throughout the year.



DACTYLOCTENIUM Willd.

Key to species

1. Annuals; spikes 2–5 cm long; back of the rachis without a slit-like groove on each side of the keel.. ..*D. aegyptium*
1. Perennials; spikes 0.5–2 cm long; back of the rachis with a slit-like groove on each side of the keel.. .. *D. sindicum*

Dactyloctenium aegyptium (L.) P. Beauv. Ess. Agrost. Expl. Pl. 15. 1812; Blatter & McCann 262. t. 176; WI 3:2. f. 1; Bor 489. t. 54; Patel 91:332; Ch & O 259; S & J 54. *Cynosurus aegyptius* L. Sp. Pl. 72. 1753. *Eleusine aegyptiaca* (L.) Desf. Fl. Atlant. 1:85. 1798; FBI 7:295; C 3:560.

Annual, 10–15 cm tall, erect, suberect or basally geniculately ascending herbs. Leaves 5–20 × 0.3–0.6 cm, linear, glabrous or sparsely hairy, ciliate on margins. Spikes 3–7, 2–3.5 cm long, digitately arranged. Spikelets light–to dark-olivaceous-green, at times tinged purple or completely purple, rigid, laterally compressed, 0.3–0.4 cm long.

Throughout, everywhere; common.

FLS & FRS : All the year round.

Dactyloctenium sindicum Boiss. Diagn. (Ser. II) 4:131. 1859; Blatter & McCann 264; Bor 489; Patel 91: 332; S & J 54. *Eleusine aristata* Ehrenb. ex Boiss. Fl. Or. 5:557. 1881; FBI 7:296; C 3:561.

Perennial, diffuse, slender herbs. Leaves 2.5–8 cm long, ovate-lanceolate, flat, hairy, ciliate on margins. Spikes 3–7, digitate. Spikelets (including awn) 0.3–0.4 cm long.

Sandy soils, mostly near sea coasts.

FLS & FRS : Aug.–Nov.

DENDROCALAMUS Nees nom. cons.

Dendrocalamus strictus Nees in Linnaea 9:476. 1834; FBI 7:404; C 3:572; Blatter & McCann 285; Patel 91:330; S & J 54.

8–10 m tall trees, with solid, tufted culms. Leaves 9.5–30 × 1.2–3 cm, linear-lanceolate to ovate-lanceolate, glabrous. Panicles 20–25 cm long. Spikelets 0.8–1.2 × 0.2–0.5 cm, spinescent, hairy, fertile intermixed with many sterile ones.

Throughout (except Kutch) in deciduous forests; also planted at some places. (NARVANS, MANVEL-VANS)

FLS & FRS : Dec.–Mar.

DESMOSTACHYA Stapf

Desmostachya bipinnata (L.) Stapf in Dyer, Fl. Cap. 7:632. 1900; Blatter & McCann 244; Bor 491; Patel 91:332; Ch & O 258; S & J 54. *Briza bipinnata* L. Syst. Nat. (ed. 10) 2:875. 1759. *Poa cynosuroides* Retz. Obs. Bot. 4:20. 1786. *Eragrostis cynosuroides* (Retz.) P. Beauv. Ess. Agrost. 162. 1812; FBI 7:324; C 3:550.

40–60 cm tall, rigid, tufted, perennial herbs. Leaves 10–25 × 0.5–1 cm, linear, flat, glabrous. Panicles 10–30 cm long, narrowly pyramidal or columnar, often interrupted. Spikes 1–1.5 cm long. Spikelets ± 0.3 cm long, sessile, biseriate, green, often tinged violet-purple or whole panicle violet-purple.

Throughout, everywhere; common. (DABH, DABHADO)

FLS & FRS : Throughout the year.

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DICHANTHIUM Willem.

Key to species

1. Peduncle of the racemes hairy.. .. ..*D. aristatum*
1. Peduncle of the racemes glabrous :
   2. Lower glume of the sessile spikelet obovate or oblong-truncate, without a median nerve; sheath compressed; ligule a short, ciliate membrane .. ..*D. caricosum*
   2. Lower glume of the ~~sessile~~ spikelet oblong, obtuse or truncate; median nerve present; sheaths terete; ligule longish .. ..*D. annulatum*

Dichanthium annulatum (Forsk.) Stapf in Prain, Fl. Trop. Afr. 9:178. 1917; Blatter & McCann 94.t. 72; WI 3:54. f. 24; Bor 133; Patel 91:314; Ch & O 247; S & J 54; S 308. *Andropogon annulatus* Forsk. Fl. Aegpt. - Arab. 173. 1775; FBI 7:196; C 3:508.

Perennial, 30–45 cm tall, slender, tufted, erect, suberect or basally geniculate herbs. Leaves 8–20 × 0.2–0.4 cm, linear, flat, glabrous. Panicles terminal, of 3–10 subracemosely digitate spikes. Racemes 1.5–4.5 cm long, violet-purple, at length straw-coloured, 3 or often more, subdigitately fascicled, spiciform. Sessile spikelets hermaphrodite, 0.3–0.5 cm long, closely imbricating.

Throughout, everywhere; common.

FLS & FRS : All the year round.

Dichanthium aristatum (Poir.) C.E. Hubb. in Kew Bull. 1939: 654. 1939; Bor 134; Patel 91:314; S 308. *Andropogon aristatus* Poir. in Lam. Encycl. Meth. Bot. Suppl. 1:585. 1810.

In moist localities in south Gujarat (Patel, 1965). (MAVALIU, KOLHARO, DADHJU)

FLS & FRS : Aug. – Nov.

Dichanthium caricosum (L.) A. Camus in Bull. Mus. Hist. Nat. Paris 27:549. 1921; WI 3:55; Bor 134; Patel 91:314. *Andropogon caricosus* L. Sp. Pl. (ed. 2) 1480. 1763; FBI 7:196; C 3:507. *Andropogon caricosus* L. subsp. *genuinus* Hack. in DC. Mon. Phan. 6:568. 1889.

Slender or stout, erect or ascending, glabrous but for sometimes bearded nodes, tufted herbs. Leaves 3–6 cm long, very narrowly linear, tubercled, hairy, finely acuminate. Racemes 1–3, 3.5–5 cm long, subdigitately fascicled. Spikelets 0.3–0.35 mm long.

Throughout in damp places and along hedges. (ZINZVO, MARVO, ZINU-KANERU).

FLS & FRS : July-Dec.

DIGITARIA Heist. ex Fabri

Key to species and varieties

1. Racemes espiculate at the base, very long, numerous, pennately hairy at base, straight, stiff, with distant pairs of spikelets.. .. ..*D. pennata*
1. Racemes not as above, not pennately hairy, variously placed along a common axis if present, or umbellate :
   2. Hairs present on the spikelets and always verrucose, i. e. covered with minute, warty growths as if sprinkled with fine grains of sand.. .. ..*D. longiflora*
   2. Hairs on spikelets, if any, never verrucose :
      3. Hairs on the spikelets clavate, i. e. passing abruptly into an obtuse, obovate or globular head, much broader than the hair :
         4. Tips of the pedicels cupuliform with hairs on the rim and below; hairs exceeding the summit..*D. stricta*
         4. Tips of the pedicels somewhat thickened, without a rim of hairs .. ..*D. granularis*
      3. Hairs on the spikelets, if any, without a globular thickening, not clavate :
         5. Upper glume a nerved or nerveless triangular scale, 0.33–0.75 mm long; spikelets elliptic-acute to narrowly lanceolate-acute; lower glume absent :
            6. Racemes densely pubescent in the lower axils, with or without a few long hairs and a few such hairs here and there on the rachis..*D. setigera*

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6. Racemes puberulous only in the axils or nearly glabrous, never with long hairs on the rachis; .. ..*D. microbachne*

5. Upper glume well developed, mostly one-half to three-quarters, at least one-third, the length of spikelet; if occasionally less developed or very short, then either the spikelet ovate in shape or with an apiculate fruit protruding :

7. Spikelets of each pair heteromorphous; sessile spikelet nearly glabrous in front, the pedicelled coated with long hairs often spreading at maturity.. .. ..*D. biformis*

7. Spikelets of each pair not heteromorphous both spikelets of each pair with the same type of indumentum :

8. Spikelets without spreading hairs.. .. ..*D. adscendens*

8. Spikelets with spreading hairs.. .. ..*D. adscendens* subsp. *adscendens* var. *criniformis*

Digitaria adscendens (H.B. & K.) Henrard in Blumea 1:92. 1934; Bor 298; Patel 91:323; Ch & O 254; S & J 54; S 308. *Panicum adscendens* H.B. & K. Nov. Gen. & Sp. Pl. 1:97. 1816. *Digitaria sanguinalis* Scop. var. *ciliaris* Prain, Bengal Pl. 1181. 1903; C 3:457; WI 3:62. t. 28. *Digitaria marginata* Link, var. *fimbriata* (Link) Stapf in Prain, Fl. Trop. Afr. 9:440. 1919; Blatter & McCann 125. t. 78. *Paspalum sanguinale* L. var. *ciliaris* Hk.f. in Hk.f. FBI 7:15. 1896.

30-45 cm tall, slender, tufted, prostrate or basally geniculate herbs. Leaves 8-18 × 0.6-1.2 cm, linear, flat, glabrous or sparsely hairy. Racemes 4-12, 7-15 cm long, subdigitate, erect, or spreading. Spikelets lanceolate, pale-green, closely appressed to winged axis.

Throughout, everywhere; common.

FLS & FRS : July-Dec.

Digitaria adscendens (H.B.&K.) Henrard subsp. *adscendens* var. *criniformis* Henrard in Blumea 1:92. 1934; Bor 299; S & J 55.

According to Henrard, this variety differs from *D. adscendens* (H.B.&K.) Hehrard in absence of stiff, tubercled based hairs along margins of sterile lemma.

Saurashtra and north Gujarat (Mansa, Mahudi, Himmatnagar); occasional (TARODIYU)

FLS & FRS : July-Aug.

Digitaria biformis Willd. Enum. Pl. Hort. Berol. 92. 1809; Bor 299; Patel 91:323. *Panicum biforme* (Willd.) Kunth, Rev. Gram. 1:33. 1829. *Panicum sanguinale* L. var. *biforme* (Willd). Hack. ex Durr. et Schinz, Consp. Fl. Afr. 5:762. 1894.

Tufted herbs, basally geniculately ascending rooting at lower nodes; culms glabrous, stout or slender. Leaves 5-7 × 0.3-0.5 cm, linear to linear-lanceolate, glabrous. Racemes terminal, digitate, 7-15 cm long. Spikelet 0.2-0.25 cm long, lanceolate, hairy.

South Gujarat in general (Patel, 1965); precise localities are Dangs (*BS* 1439, 2296) and Baroda (*Shah* 953); not common.

FLS & FRS : Aug.-Nov.

Digitaria granularis (Trin. ex Spr.) Henr. Mon. Gen. *Digitaria* 302. 1950; Bor 301; S & J 54. *Paspalum granulare* Trin. ex Spr. Neue Entdeck. 2:47. 1821. *Paspalum pedicellare* Trin. ex Steud. Nom. (ed. 2) 272. 1841; FBI 7:19. *Digitaria pedicellaris* (Trin. ex Steud.) Prain, Bengal Pl. 1182. 1903; C 3:458; Blatter & McCann 126. t. 80.

Annual or perennial, erect, 15-25 cm long, tufted herbs. Leaves 2.4-8.5 cm long; linear-lanceolate, flat, glabrous or thinly hairy. Spikes 2-5, 2.5-5.5 cm long, racemosely arranged

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on short peduncle. Spikelets 0.13–0.15 cm long, ovate or elliptic, appressed to trigonous, slightly winged rachis.

Throughout (except Kutch), in open grasslands

FLS & FRS : July-Oct.

Digitaria longiflora (Retz.) Pers. Syn. 1:85. 1805; C 3:458; Blatter & McCann 127. t. 81; WI 2:64. t. 29; Bor 302; Patel 91:323; S 308. *Paspalum longiflorum* Retz. Obs. 4:15. 1786; FBI 7:17; C 3:458 (omne p. p. non L. 1753).

Tufted annuals, creeping and rooting at nodes or suberect, upto 45 cm tall. Leaves 1.5–7 cm long, linear to linear-lanceolate, flat, glabrous or hairy. Racemes digitate 2–5, 4–7 cm long. Spikelets 0.2–0.3 cm long, elliptic-oblong, appressed to rachis.

North to south Gujarat in dry areas. (Patel, 1965)

FLS & FRS : Aug.–Sep.

Digitaria microbachne (Presl.) Henr. in Meded. Rijksherb. 16: 13. 1930; Bor 302; Patel 91:323; S & J 55. *Panicum microbachne* J. B. Presl ex C. B. Presl. Rel. Haenk. 1:298. 1830.

Tufted, geniculately ascending herbs, with glabrous culms. Leaves 15–17.5 × 0.8–1 cm, lanceolate, glabrous or sparsely hairy. Racemes 5–8 cm long. Spikelets 0.25–0.3 cm long, ovate-lanceolate.

Saurashtra (Santapau & Janardhanan, 1967; Patel, 1965).

FLS & FRS : Aug.–Sep.

Digitaria pennata (Hochst.) Cooke, Fl. Pres. Bombay 2:941. 1909 & 3:458. 1958 (reprinted); Blatter & McCann 126. t. 79; Bor 303; Patel 91:323; S & J 55. *Panicum pennatum* Hochst. in Flora 38: 197. 1855. *Paspalum pennatum* (Hochst.) Hk. f. in Hk. f. FBI 7:16. 1896.

Tufted, slender annuals, 30-50 cm long. Leaves 2.5-15 × 0.3–0.8 cm, linear to linear-lanceolate, glabrous or sparsely hairy; distantly ciliate with long, bulbous based hairs. Spikes servral,

radiating, 7-15 cm long, on slender trigonous hairy rachis. Spikelets 2-5-nate, 0.1–0.15 cm long, elliptic.

Kutch and Saurashtra in dry areas.

FLS & FRS : Aug.–Oct.

Digitaria setigera Roth apud R. & S. Syst. Veg. 2:474. 1817; Bor 305; Patel 91:323; S 309. *Panicum corymbosum* Roxb. Hort. Beng. 7.1814 (nomen) & Fl. Ind. 1:295. 1820. *Paspalum sanguinale* Lam. var. *extensum* Hk. f. in Hk. f. FBI 7:16. 1896. *Digitaria corymbosa* (Roxb.) Merr. Enum. Phil. Fl. Pl. 1:53. 1923.

30–45 cm tall, tufted, glabrous herbs, with smooth culms. Leaves 15-20 × 1–2 cm, linear to linear-lanceolate, scabrid. Racemes subdigitately arranged on a short common axis; rachis narrowly winged. Spikelets 0.2–0.3 cm long, elliptic.

South Gujarat, in black cotton soil (Patel, 1965). There is a specimen of it from Dangs in Blatter Herbarium, Bombay. (HAIRAKALIO)

FLS & FRS : Aug.–Oct.

Digitaria stricta Roth ex R. & S. Syst. Veg. 2:474. 1817; Bor 305; Patel 91:323; Ch & O 253; S 309. *Paspalum royleanum* Nees ex Thw. Enum. Pl. Zeyl. 358. 1864; FBI 7:18. *Digitaria royleana* (Nees ex Thw.) Prain, Bengal Pl. 1182. 1903; C 3:459; Blatter & McCann 127. t. 82.

30–45 cm tall, tufted, slender, erect or shortly basally geniculate annuals. Leaves 5–15 × 0.3–0.5 cm, linear-lanceolate, flat, glabrous. Racemes 4–6, 5.5–10 cm long, terminal, subdigitate or racemose. Spikelets ± 0.1 cm long, broadly oblong or elliptic.

North to south Gujarat; not common.

FLS & FRS : Aug.–Dec.

DIMERIA R. Br.

Dimeria orinthopoda Trin. Fund. Agrost. 167. t. 14. 1820; FBI 7:104; C 3:462; Blatter & McCann 8; Bor 142; Patel 91:314; S & J 56; S 309.

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Annuals, 15–30 cm tall. Leaves 4.5–12 cm long, mostly towards base, upper ones reduced to sheaths, flat, linear, pilose. Spike-like racemes 2, 2.5–6.5 cm long, spreading or erect. Spikelets 0.4–0.5 cm long, green or tinged purple, laterally compressed.

Saurashtra in open forests.

FLS & FRS : Oct.

DINEBRA Jacq.

Dinebra retroflexa (Vahl) Panz. in Denkschr. Acad. Wiss. Munch. 270. t. 12. 1814; Blatter & McCann 264. t. 177; Bor 491; Patel 91:332; Ch & O 255; S & J 55 *Cynosurus retroflexus* Vahl, Symb. Bot. 2:20. 1791. *Dinebra arabica* Jacq. Fragm. 77. t. 121. f. 1. 1807; FBI 7:297; C 3:562.

30–60 cm tall, tufted, erect or geniculately ascending herbs. Leaves 7–25×0.4–0.8 cm, linear, flat, glabrous. Panicles 10–35 cm long, terminal. Spikes 1–4.5 cm long, racemosely arranged on slender rachis, deflexed. Spikelets 0.2–0.25 cm long (excluding awn), ovate; awn 0.25–0.3 cm long, scabrulous.

Throughout; common. (KHARIU)

FLS & FRS : Aug.–Dec.

DIPLACHNE P. Beauv.

Diplachne fusca (L.) P. Beauv. Ess. Agros. 80 & 163. 1812; FBI 7:329; C 3:552; Blatter & McCann 246. t. 163; Bor 492; Patel 91:333. *Festuca fusca* L. Sp. Pl. (ed. 2) 109. 1762.

Simple or branched, tufted, perennial herbs. Leaves 20–30 cm long, narrowly linear, rigid, convolute, rarely flat, glabrous. Panicles 7.5–30 cm long, erect. Spikelets ± 0.1 cm long, 4–10-flowered, distant on slender rachis.

North to south Gujarat in marshes.

FLS & FRS : Aug.–Jan.

ECHINOCHLOA P. Beauv.

Key to species

1. Spikelets long awned :
   2. Ligule a fringe of stiff hairs, at least in the lower leaves .. .. *E. stagnina*
   2. Ligule absent .. .. *E. crusgalli*
1. Spikelets not awned :
   3. Spikelets 0.3–0.4 mm long, not cuspidate; grain not deciduous .. .. *E. frumentacea*
   3. Spikelets 0.25–0.3 cm long, acute or cuspidate; grain deciduous .. .. *E. colonum*

Echinochloa colonum (L.) Link, Hort. Berol. 2:209. 1833; Blatter & McCann 148. t. 94; WI 3:124. Pl. 13 & f. 72; Bor 308. t. 34; Patel 91:323; Ch & O 252; S & J 55; S 309. *Panicum colonum* L. Syst. Nat. (ed. 10) 2:870. 1759; FBI 7:32; C 3:447.

Slender herbs, suberect or diffuse, 30–60 cm tall, at times prostrate. Leaves 4–30×0.4–1.5 cm, linear, glabrous or sparsely hairy, flat. Panicles 5–12 cm long, of 5–10, 1–2.5 cm long spikes. Spikelets 0.2–0.25 cm long, green or purple, nearly sessile, in 3–5-rows.

Throughout in damp places; common. (SAMO, JIRIU, MOTUJIRIU)

FLS & FRS : Throughout the year.

Echinochloa crusgalli (L.) P. Beauv. Ess. Agrost. 53 & 161. t. 11. f. 2. 1812; Blatter & McCann 150. t. 95; Bor 310; Patel 91:323; S & J 55; S 310. *Panicum crusgalli* L. Sp. Pl. 50. 1753; FBI 7:30 p. p.

Tufted annuals, 20–60 cm, tall, diffuse or suberect. Leaves 10–35×0.3–0.7 cm, linear, glabrous, flat. Panicles 5–10 cm long, terminal, of 5–10, 1–3 cm long spikes. Spikelets 0.35–0.4 cm long, ovoid, greenish or tinged purple.

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Throughout (except Kutch) in damp places; not common. (ADBAU SAMO)

FLS & FRS : Aug.–Nov.

Echinochloa frumentacea Link, Hort. Berol. 1:204. 1827; WI 3:125. f. 73; Bor 311. *Panicum frumentaceum* Roxb. Fl. Ind. 1:307. 1820 (non Salisb. 1796). *Panicum stagninum* Retz. var. *frumentacea* (Link) Trim. Cat. Ceyl. Pl. 104. 1885; FBI 7:31; C 3:446. *Echinochloa colonum* (L.) Link var. *frumentacea* (Link) Ridley, Fl. Malay. Penin. 5:223. 1925; Blatter & McCann 149

Annuals, glabrous, 60–70 cm tall, tufted. Leaves 12–30 × 0.6–1.5 cm, linear–lanceolate, glabrous. Panicles 12–18 cm long, pyramidal. Spikes 1.5–3.5 cm long, solitary or geminate, straight or falcate, lax or compact. Spikelets 0.25–0.3 cm long, ovoid.

Cultivated; also an escape. (BANTI)

FLS & FRS : Oct.–Jan.

Echinochloa stagnina (Retz.) P. Beauv. Ess. Agrost. 53 & 161 & 172. 1812; Blatter & McCann 151; WI 3:126. t. 74; Bor 311; Patel 91:324; S & J 55. *Panicum stagninum* Retz. Obs. Bot. 5:17. 1789; C 3:446.

Tall, annual or perennial, geniculately ascending from a prostrate base, at times rooting at lower nodes. Leaves 15–45 cm long, linear. Panicles 10–20 cm long, on slender, glabrous rachis. Spikelets 0.4–0.5 cm long, ovoid-lanceolate, awned, hairy from bulbous bases.

Throughout (except Kutch), in moist places.

FLS & FRS : Aug.–Nov.

ELEUSINE Gaertn.

Key to species

1. Annuals; basal sheaths glabrous at base :
   2. Spikes slender, narrow, nearly glabrous at base; seeds oblong, obtusely trigonous .. .. *E. indica*

   2. Spikes stout, broad, incurved, hairy at base; seeds globose .. .. *E. coracana*
1. Perennials; basal sheaths woolly at base.. .. *E. compressa*

Eleusine compressa (Forsk.) Aschers. & Schweinf. ex C. Christensen in Dansk. Bot. Archiv. 4(no.3): 12. 1922; Bor 492; Patel 91:333; S & J 55. *Panicum compressa* Forsk. Fl. Aegpt.–Arab. 18. 1775. *Eleusine flagellifera* Nees in Linnaea 16:220. 1842; FBI 7:294. C 3:560

Prostrate, long spreading, proliferously branched perennial herbs, with thickened, leafy nodes. Leaves 2-4 × 0.2-0.3 cm, rigid, nearly subulate, glabrous, recurved, acute at apex. Spikes 3–6, 1.5–2.5 cm long, nearly oblong, digitate. Spikelets 0.2–0.3 cm long, imbricate, 4-6–flowered, lanceolate, glabrous.

Kutch, Saurashtra and north Gujarat (Keshni); common in the last locality.

FLS & FRS : July–Nov.

Eleusine coracana (L.) Gaertn. Fruct. 1:8. t. 1. f. 11. 1789; FBI 7:294; C 3:561; Blatter & McCann 260. t. 173; WI 3:160. ff. 103 & 104 & Pl. 16; Bor 492; Patel 91:333; Ch & O 259. *Cynosurus coracanus* L. Syst. Nat. (ed. 10) 2:875. 1759.

Stout herbs, 60–100 cm tall, glabrous. Leaves 20–40 × 1–1.8 cm, linear, glabrous. Spikes 6–10, 5–15 × 1–1.5 cm, digitately umbellate. Spikelets 0.2–0.4 cm long, glabrous, ovoid, apiculate.

Cultivated or an escape (NAGLI, RAGI, BAVATO)

FLS & FRS : Aug.–Nov.

Eleusine indica (L.) Gaertn. Fruct. 1:8. 1789; FBI 7:293; C 3: 560; Blatter & McCann 259. t. 172; WI 3:166. t. 105; Bor 493; Patel 91:333; Ch & O 259; S & J 55; S 310. *Cynosurus indicus* L. Sp. Pl. 72. 1753.

30–50 cm tall, simple or branched, tufted annuals. Leaves 12–30 × 0.2–0.4 cm, linear, flat, glabrous or sparsely hairy. Spikes 2–6, 4–11 cm long, digitately or subdigitately umbellate, with 1

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or 2 below umbel, erect or curved. Spikelets 0.3–0.4 cm long, ovate or oblong, biseriate, secund.

Throughout; common. (ADHAN NAGLI, UKDO)

FLS & FRS : July–Jan.

ELYONURUS H. & B. ex Will

Elyonurus royleanus Nees ex A. Rich. Tent. Fl. Abyss. 2:471. 1851; FBI 7:161; C 3:491; Blatter & McCann 37: Bor 145; Patel 91:314; S & J 55.

Slender, 10–30 cm tall, leafy, geniculate herbs, glabrous but for pubescent nodes. Leaves 3.5–9 × 0.1–0.2 cm, linear–lanceolate, acute, rigid, glabrous or sparsely hairy. Racemes 2.5–5 cm long, erect, yellowish–green, often variegated purple; sessile spikelets 1–1.2 cm long (including beak), hairy.

Kutch and Saurashtra in sandy soils.

FLS & FRS : Aug.–Oct.

ELYTROPHORUS P. Beauv.

Elytrophorus spicatus (Willd.) A. Camus in Lecomte Fl. Gen. I' Indo–China 7:547. 1923: Bor 493; Patel 91:333; S 310. *Dactylis spicata* Willd. in Ges. Naturf. Fr. Berl. Neue Schrift 3:416. 1801. *Elytrophorus articulatus* P. Beauv. Ess. Agrost. 67. t. 14. f. 2. 1812; FBI 7:306; C 3:567; Blatter & McCann 276. t. 188.

10–25 cm tall, tufted, slender, simple or branched herbs. Leaves 7–25 cm long, linear, flat, glabrous or sparsely hairy beneath. Spikes 3.5–20 cm long, terminal, cylindrical, often interrupted at base. Spikelets 0.2–0.4 cm long, in globose or ovoid clusters.

North to south Gujarat; in cultivated fields after harvest.

FLS & FRS : Oct.–Dec.

ERAGROSTIELLA Bor

Key to species

1. Keel of the palea broadly winged; leaves narrow, almost filiform when rolled or folded... .. ..*E. bifaria*

1. Keel of the palea not broadly winged; leaves convolute, filiform or broader and shorter, complicate.. ..*E. brachyphylla*

Eragrostiella bifaria (Vahl) Bor in Indian For. 66:270. 1940 & Grasses of Burma, Ceylon, India and Pakistan 494. 1960; Patel 91:333; S 310. *Poa bifaria* Vahl, Symb. Bot. 2:19. 1791. *Eragrostis bifaria* Wt. ex Steud. Nom. Bot. (ed. 2) 1:562. 1840 (nomen) et Syn. Pl. Glum. 1:264. 1854; FBI 7:325; C 3:550; Blatter & McCann 241.

Perennial herbs, densely tufted, glabrous, erect or basally geniculate. Leaves 1.5–5 cm long, narrowly linear, rigid, folded. Spikes 10–15 cm long, terminal. Spikelets 0.3–0.6 cm long, ovoid to ovoid–lanceolate or oblong, laterally compressed, secund, many–flowered, olive–grey or green.

North and central Gujarat (Chhotaudepur).

FLS & FRS : Aug.–Sep.

Eragrostiella brachyphylla (Stapf) Bor in Ind. For. 66:270. 1940 & Grasses of Burma, Ceylon, India & Pakistan 494. 1960; Patel 91:334; S & J 55. *Eragrostis brachyphylla* Stapf apud Hk. f. in Hk. f. FBI 7:327. 1896; Blatter & McCann 242.

A perennial, slender, tufted herb, 25–40 cm tall. Leaves 5–10 × 0.2–0.25 cm, all radical, narrowly linear, flat or conduplicate. Spikes 7–20 cm long, slender, terminal. Spikelets 0.6–1.5 cm long, closely set, linear to linear–oblong, secund, 2–seriate, olive–green, about 20–flowered.

Saurashtra and Gujarat, in rocky soil (see Patel, 1965). Blatter & McCann (1935) cite loc. Sevalia in Panchmahals.

FLS & FRS : Oct.–Dec.

ERAGROSTIS P. Beauv.

Key to species and varieties

1. Spikelets breaking up from above downwards; rachilla fragile :

2. Lemmas ciliate on margins.. .. .. ..*E. ciliata*

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2. Lemmas eciliate on margins :
   3. Keel of the palea more or less ciliate :
      4. Panicles spiciform or compact and dense :
         5. Panicle spiciform, more or less lobed or interrupted.. .. .. ..*E. ciliaris* var. *ciliaris*
         5. Panicle short, thick, compact ... *E. ciliaris* var. *brachystachya*
      4. Panicles effuse :
         6. Culms and leaves more or less viscous.. .. ..*E. viscosa*
         6. Culms and leaves not viscous.. ..*E. tenella*
   3. Keels of the palea scabrid or smooth, eciliate :
      7. Branches of panicle more or less whorled; spikelets loose, scattered, few-flowerd; lemma less than 0.1 cm long.. .. ..*E. japonica*
      7. Branches of panicle mostly solitary; spikelets densely clustered, 6–14–flowered; lemma about 0.1 cm long.. .. ..*E. diarrhena*

1. Spikelets breaking up from below upwards; rachilla tough :
   8. Lemmas upto 0.15 cm long :
      9. Plants glandular :
         10. Lowest branches of the panicle fascicled or subwhorled; plants glandular, if eglandular, then lemmas over 1.5 mm long.. .. ..*E. pilosa*
         10. Lowest branches of the panicle not fascicled or whorled; pedicels usually with a crateriform gland.. .. ..*E. poaeoides*
      9. Plants eglandular.. .. ..*E. nutans*
   8. Lemmas over 0.15 cm long :
      11. Leaves usally with raised glands on keel and margins; sheaths with irregularly distributed pitted glands.. .. ..*E. cilianensis*

      11. Plants devoid of glands .. .. :
         12. Spikelets 0.2 cm or more wide.. ..*E. unioloides*
         12. Spikelets 0.075–0.2 cm wide.. .. ..*E. tremula*

Eragrostis cilianensis (All.) Link ex Vignolo–Lutati in Malpighia 18:386. 1904; Blatter & McCann 237. t. 157; Bor 503; Patel 91:334; S & J 55; S 311. *Briza eragrostis* L. Sp. Pl. 70. 1753. *Poa cilianensis* All. Fl. Pedem. 2·246. t. 91. f. 2. 1785. *Eragrostis major* Host, Gram. Austr. 4:14. t. 24. 1809; FBI 7:320; C 3:548.

Annual, 20–60 cm tall, tufted, erect or basally geniculate, glabrous herbs. Leaves 6–10 × 0.4–0.8 cm. ovate-lanceolate, glabrous. Panicle 8–15 cm long, oblong, lax or contracted, terminal. Spikelets 0.5–1.5 × 0·2–0.3 cm, flat, compressed, ovate, pale-greenish-white or straw-coloured, many-flowered, longer than capillary pedicels.

Throughout; occasional.

FLS & FRS : Oct.–Jan.

Eragrostis ciliaris (L.) R. Br. var. **brachystachya** Boiss. Fl. Orient. 5:582. 1884; C 3:545; Bor 506; S & J 55.

Kutch, Saurashtra, north Gujarat (Ahmedabad), central Gujarat (Baroda) and Rajpipla; on the whole rare.

FLS & FRS : Sep.–Dec.

Eragrostis ciliaris (L.) R. Br. var. **ciliaris;** Bor 506. *Eragrostis ciliaris* (L,) R. Br. in Tuckey Narr. Exp. Congo App. 478. 1818; FBI 7:314; Blatter & McCann 231. t. 154; Ch & O 256; Patel 91:334; S & J 55.

Annuals, 10–40 cm tall, tufted, glabrous, basally geniculate. Leaves 5–7 × 0.2–0.5 cm, very narrowly linear to linear–lanceolate, glabrous. Panicles 3–7 cm long, cylindric, spiciform, more or less lobed or interrupted. Spikelets ± 0.2 cm long, densely aggregating, 6–12–flowered, strongly compressed.

Scanned by CamScanner

Throughout (except Kutch) on old walls or sandy grounds. (MURMUR).

FLS & FRS : Oct.-Jan.

Eragrostis ciliata (Roxb.) Nees, Agros. Bras. 512 1829; FBI 7:313; C 3:544; Bor 506; Patel 91:334. *Poa ciliata* Roxb. Fl. Ind. 1:336. 1820. *Poa rupestris* Roth ex R. & S. Syst. Veg. 2:592. 1817 (non Withering 1796); Roth, Nov. Pl. Sp. 71. 1821. *Eragrostis rupestris* (Roth ex R. & S.) Steud. Syn. Pl. Glum. 1:265. 1854; Blatter & McCann 230.

Perennial, 30–75 cm tall, erect or basally geniculate herbs. Leaves 5–15 × 0.25–0.4 cm, linear-lanceolate, flat or convolute acuminate. Panicles 5-7.5 × 0.6–0.8 cm long, cylindric, compact. Spikelets 0.25–0.4 cm long, much compressed, 6–12-flowered.

In open areas of south Gujarat (Patel, 1965); Blatter & McCann (1935) cite loc. Dumas near Surat.

FLS & FRS : Oct.-Nov.

Eragrostis diarrhena (Schult.) Steud. Syn. Pl. Glum. 266. 1854; Bor 507; Patel 91:334; S 311. *Poa diarrhena* Schult. Mant. 2:616. 1827. *Eragrostis koenigii* Link, Hort. Berol 2:294. 1833. *Eragrostis interrupta* (R. Br.) P. Beauv. var. *diarrhena* (Schult.) Stapf apud Hk. f. in Hk. f. FBI 7:316. 1896. *Eragrostis interrupta* (R. Br.) P. Beauv. var. *koenigii* (Link) Stapf apud Hk. f. in Hk. f. FBI 7:316. 1896; C 3:546. *Eragrostis interrupta* auct. non (R. Br.) P. Beauv.; Blatter & McCann 233 (p. p.).

A tufted, slender, 60–75 cm tall geniculately erect, glabrous herb. Leaves 5-30×0.3-0.8 cm, linear, flat. Panicles 20-30 cm long, contracted, of appressed or shortly spreading, numerous, fascicled or subwhorled, 3–5 cm long branches, giving panicle a lobed appearance. Spikelets very minute, often purplish or pinkish, ovate to linear.

Throughout, in river beds.

FLS & FRS : Oct.-Feb.

Eragrostis japonica (Thunb.) Trin. in Mem. Acad. Sci. Petersb. (Ser. 6) 1:405. 1831; Bor 509; Patel 91:334; Ch & O 257; S & J 55; S 311. *Poa japonica* Thunb. Fl. Jap. 51.1784. *Eragrostis interrupta* non (R. Br.) Beauv. 1812; Sensu Stapf apud Hk. f. in Hk. f. FBI 4:316. 1896; C 3:546. Blatter & McCann 233 (p. p.). *Eragrostis interrupta* P. Beauv. var. *tenuissima* Stapf apud Hk. f. in Hk. f. FBI 7:316. 1896.

Very similar to *E. diarrhena* (Schult.) Steud, but differs in panicles which are made up of whorled branches and lemma less than 0.1 cm long.

Throughout (except Kutch), in cultivated fields and river beds.

FLS & FRS : All the year round.

Eragrostis nutans (Retz.) Nees ex Steud. Nom. Bot. (ed. 2) 563. 1840; Bor 511; Patel 91:334. *Poa nutans* Retz. Obs. Bot. 4:19. 1786. *Poa chariis* Schult. Mant. 2:314. 1824. *Eragrostis gangetica* auct. non Steud.; C 3:547; Blatter & McCann 236. t. 160. *Eragrostis elegantula* Nees ex Steud. Syn. Pl. 1:266. 1854 (non Nees 1841). *Eragrostis stenophylla* auct. non Hochst. ex Miq.; FBI 7:318; C 3:547 (p. p.)

Densely tufted, 30–45 cm tall, erect or geniculately ascending, simple or branched, perennial herbs. Leaves 7.5-12.5 cm long, very narrow, stiff, convolute, glabrous. Panicles ovate or oblong or sublinear, suberect or nodding. Spikelets 0.4–0.6 cm long, 20–30– flowered.

From south Gujarat, generally in sandy localities (Patel 1965). (FUTIU, CHIKATU)

FLS & FRS : Oct.-Dec.

Eragrostis pilosa (L.) P. Beauv Ess. Agros. 71. 1812; FBI 7: 323; C 3: 550; Blatter & McCann 241.t. 160; Bor 512; S & J 55. *Poa pilosa* L. Sp. Pl. 68.1753.

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Annual herles, 15-30 cm tall, tufted, erect or geniculately ascending. Leaves 5-18 cm long, very narrowly linear, flat, glabrous. Panicles 9-20 cm long, erect, broadly elliptic. Spikelets 0.2-0.4 cm long, pedicellate, ovate or narrowly elliptic.

Common.

FLS & FRS : July-Oct.

Eragrostis poaeoides P. Beauv. Ess. Agrost. 162. 1812; Bor 512; Patel 91:335; Ch & O 258. *Poa eragrostis* L. Sp. Pl. 68.1753. *Eragrostis minor* Host, Gram. Austr. 4:15. 1809 (*in nota*) & Fl. Austral. 135. 1827; FBI 7:321; C 3:548; Blatter & McCann 238. t. 158.

40-45 cm tall, tufted, erect or geniculate herbs. Leaves 6-10 × 0.2-0.4 cm, linear, flat or slightly involute, glabrous. Panicles 15-20 cm long, oblong or obovate. Spikeletes 0.8-1 cm long, narrowly oblong, compressed, pale-greenish or tinged violet.

North to south Gujarat; not common.

FLS & FRS : Sep.-Mar.

Eragrostis tenella (L.) P. Beauv. ex R. & S. Syst. Veg. 2:576. 1817; FBI 7:315; C 3:545; Patel 91:335; Bor 513; Ch & O 257; S & J 55; S 311. *Poa tenella* L. Sp. Pl. 69.1753. *Poa amabilis* L. Sp Pl. 68. 1753. *Poa plumosa* Retz. Obs. Bot. 4:20. 1786. *Eragrostis Poa plumosa* (Retz.) Link, Hort. Berol. 1:192. 1827: WI 3:182. f. 116. *Eragrostis tenella* (L.) P. Beauv. var. *plumosa* (Retz.) Stapf apud Hk f. in Hk. f. FBI 7:315. 1896; C 3:546; Blatter & McCann 232. t. 155.

Erect or suberect, 10-30 cm tall, slender, geniculate annuals. Leaves 2-11 × 0.2-0.4 cm, narrowly linear, flat or convolute, glabrous. Panicles 10-25 cm long, ovate-oblong or cylindric, effuse, open or contracted. Spikelets 0.2-0.4 cm long, oblong, pale-green, often tinged.

Throughout; common. (KALAVO, LIMOR)

FLS & FRS : Throughout the year.

Eragrostis tremula (Lam.) Hochst. ex Steud. Syn. Pl. Glum. 269. 1854; FBI 7:320; C 3:549; Blatter & McCann 239. t. 159; Bor 514; Patel 91:335. *Poa tremula* Lam. Tab. Encycl. Meth. Bot. 1:185. 1791.

Annual, 15-70 cm tall, tufted, slender, erect or geniculate, ascending, glabrous. Leaves 5-11 × 0.2-0.3 cm, linear-lanceolate, glabrous or sparsely hairy. Panicles 10-15 cm long. Spikelets 1.7-2.5 × 0.2-0.4 cm, straight or falcate, linear, compressed at length silvery-white or pale-brown.

Throughout, everywhere; common.

FLS & FRS : Aug.-Feb.

Eragrostis unioloides (Retz.) Nees ex Steud. Syn. Pl. Glum. 1:264. 1854; Blatter & McCann 235. t. 156; Bor 515; Patel 91: 335; Ch & O 258; S & J 35; S 312. *Poa unioloides* Retz. Obs. 5:19. 1789. *Eragrostis amabilis* auct. non *Poa amabilis* L. 1753; FBI 7:317; C 3:547.

Annual, densely or loosely tufted, slender, glabrous, erect or ascending, 10-30 cm tall herbs. Leaves 5.5-20 × 0.3-0.8 cm, linear to linear-lanceolate, flat, glabrous or sparsely hairy. Panicles 5-20 cm long, ovate, oblong, or broadly lanceolate, at first green, then violet-purple, at length straw-coloured. Spikelets 0.4-1 × 0.2-0.4 cm, ovate to ovate-lanceolate, laterally much compressed, 20-50-flowered.

Throughout, in damp places.

FLS & FRS : July-Dec.

Eragrostis viscosa (Retz.) Trin. in Mem. Acad. Sci. Petersb. (Ser. VI) 1:397. 1830; Blatter & McCann 233; Bor 515; Patel 91:335; Ch & O 256; S & J 55; S 312. *Poa viscosa* Retz. Obs. Bot. 4:20. 1786. *Eragrostis tenella* (L.) P. Beauv. var. *viscosa* (Retz.) Stapf apud Hk. f. in Hk. f. FBI 7:315. 1896; C 3:546.

Very similar to *Eragrostis tenella* P. Beauv. in general appearance but it differs from the latter in having culms and leaves more or less viscous.

Scanned by CamScanner

Throughout; common. (CHIKA'TIU)

FLS & FRS : July-Dec.

EREMOPOGON (Hack.) Stapf

Eremopogon foveolatus (Del.) Stapf in Prain, Fl. Trop. Afr. 9:183. 1917; Blatter & McCann 96. t. 64; Bor 148; Patel 91:315; Ch & O 247; S & J 55. *Andropogon foveolatus* Del. Fl. d'Egypte 16. t. 8. f. 2. 1812; FBI 7:168; C 3:496.

30–50 cm tall, tufted, erect or geniculate, glabrous herbs. Leaves 3–15 cm long, very narrowly linear, flat. Spike 3–4.5 cm long, cylindric, solitary. Spikelets 0.3–0.5 cm long, oblong-lanceolate, glabrous, purplish.

Throughout in open dry areas. (SANIAR, SURVALI)

FLS & FRS : July-Nov.

ERIOCHLOA Kunth

Eriochloa procera (Retz.) C. E. Hubb. in Kew Bull. 1930: 256. 1930; Bor 312; Patel 91:324; Ch & O 253; S & J 55. *Agrostis procera* Retz. Obs. Bot. 4:19. 1786. *Milium ramosum* Retz. Obs. 2:775. 1891; Blatter & McCann 131. t. 84. *Eriochloa polystachya* auct. non H. B. & K. 1816; FBI 7:20; C 3:461.

Annual or perennial herbs, 45–60 cm tall, solitary or densely tufted, glabrous, but for swollen, pubescent nodes. Leaves 8–30 cm long, erect, linear to linear-lanceolate, glabrous, flat, involute when dry. Panicles 6–15 cm long, erect, of few to many spike-like, alternate, suberect, 1.8–4 cm long racemes. Spikelets 0.3–0.4 cm long, secund, ovate-lanceolate, sparsely appressed-pilose, dorsally compressed, solitary or geminate.

Throughout (except Kutch), in damp places.

FLS & FRS : July-Sep.

EULALIA Kunth

Eulalia trispicata (Schult.) Henr. in Blumea 3:453. 1940; Bor 157; Patel 91:315. *Andropogon tristachyus* Roxb. Hort. Beng. 6.1814 (nomen) & Fl. Ind 1:261. 1820 (non H. B. &. K. 1816). *Andropogon trispicatus* Schult. Syst. Veg. 2. Mant. 452. 1824. *Pollinia argentea* Trin. in Bull. Acad. Sci. Peters. 1:71. 1836; FBI 7:111; C 3:467. *Eulalia argentea* Brongn. in Duperr. Voy. Coq. Bat. 2(2):92. 1830; Blatter & McCann 52. t. 35.

25–60 cm tall, perennial herbs, tufted, erect or geniculate, glabrous. Leaves 10–25 cm long, linear, flaccid, flat, glabrous or sparsely hairy. Spike-like racemes 6–12, 4–10 cm long, laxly flowered. Spikelet 0.3–0.4 cm long, brown.

South and central Gujarat; rare.

FLS & FRS : Aug.-Oct.

EULALIOPSIS Honda

Eulaliopsis binata (Retz.) C. E. Hubb. in Hk. Ic. Pl. sub tab. 3262. 1935; Bor 158; Patel 91:315; S & J 56. *Andropogon binatus* Retz. Obs. Bot. 5:21. 1789. *Ischaemum angustifolium* (Trin.) Hack. Mon. Phan. 241. 1889; FBI 7:129; C 3:478. *Pollinidium binatum* (Retz.) Hubb. in Kew Bull. 1932: 72.1932; Blatter & McCann 24. t. 16.

Tufted, 60–90 cm tall, erect, slender, simple or sparingly branched, glabrous herbs. Leaves 30–60 × 0.2–0.5 cm, narrowly linear, concave or convolute. Racemes 2–4, on axillary and terminal, filiform, 2.5–5 cm long peduncles. Spikelets 0.35–0.4 cm long, lanceolate with hairy callus, sessile and pedicellate.

Saurashtra in dry sandy ground.

FLS & FRS : Feb.-May

HACKELOCHLOA O. Ktze.

Hackelochloa granularis (L.) O. Ktze. Rev. Gen. Pl. 776. 1891; Bor 159; Patel 91: 315; Ch & O 243; S & J 56; S 313. *Cenchrus granularis* L. Mant. 2:App. 575. 1771. *Manisuris granularis* L. f. Nov. Gram. Gen. 40. 1779; FBI 7:159; C 3:473; Blatter & McCann 32. t. 22.

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10–45 cm tall, erect or geniculate, tufted, glabrous herbs. Leaves 4–10×0.3–0.6 cm, linear to linear-lanceolate, hairy. Racemes 1–1.2 cm long, resembling a string of beads, solitary or seemingly fascicled, in axils of leaves. Spikelets ±0.1 cm across, nearly globose, pale-brown.

Throughout (except Kutch); not common. (KASIU)

FLS & FRS : July-Jan.

HALOPYRUM Stapf

Halopyrum mucronatum (L.) Stapf in Hk. Ic. Pl. t. 2448. 1896; FBI 7:328; C 3:557; Blatter & McCann 242. t. 161; Bor 516; Patel 91:335; S & J 56. *Uniola mucronata* L. Sp. Pl. (ed.2) 104. 1762.

Tall, stout, tufted, perennial, 30–60 cm tall, glabrous herbs with fascicled branches. Leaves 10–25×0.3–0.4 cm, convolute, rarely flat, very narrowly linear, glaucous, glabrous. Panicles 30–40 cm long, erect or nodding with smooth, glabrous, filiform rachis and branches. Spikelets 1.2–1.5 cm long, flat, sessile or shortly pedicellate, smooth, white or creamy-white.

In the coastal areas and saline soil. (KANS, DARIAI-KANSDO)

FLS & FRS : Oct.–Nov.

HEMARTHRIA R. Br.

Hemarthria compressa (L. f.) R. Br. Prodr. 207. 1810; Blatter & McCann 31. t. 21; WI 4:31. f. 21; Bor 161; Patel 91:315; S & J 56. *Rottboellia compressa* L. f. Suppl. 114. 1781; FBI 7:153; C 3:470.

Perennials, 50–70 cm tall, erect from a decumbent base. Leaves 6.5-8 cm long, linear, flat, glabrous. Racemes 8–15 cm long, few to many, fascicled, axillary and terminal, erect, straight or slightly falcate, pale-green to tinged purple; joints of rachis thickened. Sessile spikelet 0.4–0.5 cm long.

Throughout (except Kutch), along roads and railway lines.

FLS & FRS : Aug.–Dec.

HETEROPOGON Pers.

Key to species

1. Annuals.. .. ..*H. ritchiei*
1. Perennials :
   2. Racemes smooth and glabrous, 10–15 cm long; lowest 12–15 pairs of spikelets homogamous; lower glume of fertile spikelets 0.8–0.9 cm long.. .. ..*H. triticeus*
   2. Racemes not more than 6 cm long; lower glume of fertile spikelet not more than 0.7 cm long; lower 2–6 pairs of spikelets homogamous.. .. ..*H. contortus*

Heteropogon contortus (L.). P. Beauv. ex R. & S. Syst. Veg. 2:836. 1817; WI 4:42. t. 30; Blatter & McCann 109. t. 71; Bor 163; Patel 91:315; Ch & O 249; S & J 56; S 313. *Andropogon contortus* L. Sp. Pl. 1045. 1753; FBI 7:199; C 3:510.

Perennial, 60–75 cm tall, tufted, erect or basally geniculate, slender herbs. Leaves 8–17.2×0.2–0.3 cm, linear, flat or folded. Racemes 2–5 cm long, solitary, terminal. Spikelets 0.3–0.5 cm long, close imbricate, sessile, pubescent, dark-brown, upper females long awned, lower males or neuter, awnless.

Throughout, scattered or gregarious; common. (DABH-SULIU, KAGADIU, SUKHLI).

FLS & FRS : July-Jan.

Heteropogon ritchiei (Hk. f.) Blatter & McCann in Journ. Bombay nat. Hist. Soc. 32:623. 1928 & Bombay Grasses 108. t. 70. 1935; Bor 165; Patel 91:316; S 313. *Andropogon ritchiei* Hk. f. in Hk. f. FBI 7:201. 1896; C 3:509.

Stout, erect, rigid, 1–1.5 m or more tall. Leaves 30–50×1–1.5 cm, linear, flat, rigid, shortly hairy on both sides; hairs bulbous based. Racemes 2–5 cm long, hispid, lower 1–2 pairs of spikelets homogamous. Sessile spikelet 0.6–0.8 cm long, hispid. Pedicellate spikelet 1–1.3 cm long.

Scanned by CamScanner

North to south Gujarat, in dry or slightly moist places. Saxton has collected it from Dangs in November, 1921.

FLS & FRS : Sep.–Nov.

Heteropogon triticeus (R. Br.) Stapf ex Craib: in Kew Bull. 1912: 432; Bor 165; Patel 91:316; Ch & O 249; S & J 56; S 313. *Andropogon triticeus* R. Br. Prodr. 201.1810; FBI 7:200; C 3:509. *Heteropogon insignis* Thw. Enum. 437. 1864; Blatter & McCann 108. t. 69.

Perennial, 1.2–2 m tall, stout, smooth, polished herbs. Leaves 30–60 × 0.6–2 cm, narrowly linear, glacuous, sparsely hairy, scabrous on margins. Racemes 7.5–15 cm long, glabrous. Spikelets very many and most of them imbricating; upper sessile spikelets long awned, 0.7–0.8 cm long, upper pedicellate reaching 2 cm long, neuter; awns stout, hispid, 5–7 cm long.

Throughout (except Kutch), gregarious in exposed ground.

FLS & FRS : Aug.–Oct.

HORDEUM L.

Hordeum vulgare L. Sp. Pl. 84. 1753; FBI 7:37; C 3:575; Blatter & McCann 281; WI 5:118. ff. 78 & 80; Bor 677; Patel 91:338.

An erect, glabrous, annual herb, 75–100 cm tall. Leaves 15–30 × 0.6–1.3 cm, flat, scabrid on both surfaces. Spikes emerging from leaf sheaths, 2-ranked, 7.5–9 cm long without awns and 18–20 cm with awns. Spikelets in each row 10–15, two rows of barren spikelets, alternating with each row of fertile spikelets.

Cultivated at some places e. g. Panchmahals, Ahmedabad, and Kaira as a rabi crop (See Blatter & McCann). (BARLEY, JAV).

FLS & FRS : Feb.–Mar.

HYGRORYZA Nees

Hygroryza aristata (Retz.) Nees ex W. & A. in Edinb. New Phil. J. 15:380. 1833; FBI 7:75; Blatter & McCann 271. t. 184; Bor 597. *Pharus aristatus* Retz. Obs. 5:23. 1789. *Leersia aristata* Roxb. Hort. Beng. 26. 1814 (nomen) & Fl. Ind. 207. 1832.

Floating, glabrous herbs, with inflated sheaths. Leaves 2.5–7.5 × 1–2 cm, linear, ovate–oblong, ovate–elliptic or elliptic–oblong, scabrulous above, smooth beneath. Panicle 3–5 cm long and as much broad, triangular in outline. Spikelets very narrow, 0.5–0.6 cm long, with 1.3–1.5 cm long awn.

In ponds at some places viz. Ahmedabad, Baroda, Chikli and Bulsar.

FLS & FRS : Sept.–Dec.

IMPERATA Cyr.

Imperata cylindrica (L.) P. Beauv. Ess. Agrost. 165. t. 5. f. 1. Expl. Planch. 5. 1812; Blatter & McCann 42. t. 30; Bor 169; Patel 91:316; S & J 56. *Lagurus cylindricus* L. Syst. Nat. (ed. 10) 878. 1759. *Saccharum cylindricum* (L.) Lam. Encycl. Meth. Bot. 1:594. 1785. *Imperata arundinacea* Cyr. Pl. Rar. Neap. 2:26. t. 11. 1792; FBI 7:106; C 3:464.

An erect, simple, slender, 45–75 cm tall herbs, with creeping, stoloniferous root-stocks. Leaves 6–15 × 0.2–0.4 cm, narrowly linear, flat, glabrous. Panicles 4–8 cm long, spike-like, cylindric, compact branches and branchlets numerous, crowded, appressed. Spikelets lanceolate.

Throughout, scattered; common. (SAR–GHAS, CHHAI)

FLS & FRS : Sep.–May.

ISACHNE R. Br.

Key to species

1. Margins of leaves and tips of pedicels not or scarcely thickened; panicle lax; leaves narrowly lanceolate .. *I. globosa*
1. Margins of leaves and tips of pedicels distinctly thickened; panicle dense; leaves ovate–lanceolate.. .. .. *I. dispar*

Scanned by CamScanner

Isachne dispar Trin. Sp. Gram. 1: t. 86. 1828; Bor 580; Patel 91:336; S 314.

Annual herbs, 15–40 cm tall, with spongy culms. Leaves 1.3-6.5×0.4–1 cm, ovate to ovate-lanceolate, flat, scabrulous. Panicles 1.5–5 cm long, pyramidal and open or contracted and ovoid. Spikelets±0.1 cm long, green or purple, smooth, polished.

Moist places in Saurashtra (Patel, 1965).

FLS & FRS : Sep.–Feb.

Isachne globosa (Thunb.) O. Ktze. Rev. Gen. Pl. 2:778. 1891; Patel 91:336. *Milium globosus* Thunb. Fl. Jap. 49. 1784. *Isachne australis* R. Br. Prodr. 1:196. 1810; FBI 7:24; C 3:439; Blatter & McCann 188.

Slender, glabrous herbs, erect or suberect, 15–40 cm tall, from creeping base Leaves 4–12.5 × 0.4–1 cm, lanceolate, ovate-lanceolate or linear, flat, nearly glabrous. Panicles 3.5–20 cm long, ovoid or pyramidal, contracted or open. Spikelets 0.15-0.2 cm long, globose, at first green, at length most of them violet or purple.

South and central Gujarat; in moist ground.

FLS & FRS : Aug.–Oct.

ISCHAEMUM L.

Key to species and varieties

1. Margins of the lower glume of the sessile spikelet extended below the middle :
   2. Keel of the upper glume of sessile spikelet not winged above the middle.. .. ..*I. timorense*
   2. Keel of the upper glume of the sessile spikelet winged above the middle :
      3. Leaves glabrous or puberulous.. .. ..*I. indicum* var. *indicum* subvar. *indicum*
      3. Leaves and sheaths villous with erect hairs.. .. ..*I. indicum* var. *indicum* subvar. *villosum*

1. Margins of the lower glume of the sessile spikelet narrowly and evenly turned from base to apex :
   4. Leaves sessile :
      5. Pedicel of the pedicelled spikelet more than one-third the length of the sessile spikelet :
         6. Annuals.. .. ..*I. pilosum*
         6. Perennials.. .. ..*I. diplopogon*
      5. Pedicel of the pedicelled spikelet less than one-third the length of the sessile spikelet :
         7. Lower glume of sessile spikelet coriaceous with nodules on the rounded keels, sometimes the latter inconspicuous :
            8. Perennials; racemes terminal to the culms; spikelets 0.55–0.75 cm long.. .. ..*I. goebelii*
            8. Annuals; racemes in fascicles from the uppermost nodes; spikelets 0.4–0.75 cm long ..*I. santapaui*
         7. Lower glume of sessile spikelet crustaceous with side nodules jointed by sharp ridges or crustaceous with very obscure nodules and ridges :
            9. Ridges deep; lower glume glabrous on dorsal surface or pilose; leaves tapering at base.. .. ..*I. rugosum*
            9. Ridges very shallow; dorsal surface of lower glume often almost smooth and frequently densely covered with white hairs; leaves cordate at base .. ..*I. molle*
   4. Leaves petiolate :
      10. Racemes awned; sessile spikelet 0.6 cm long; leaves upto 9×1.5 cm.. .. .. ..*I. semisagittatum*
      10. Racemes mostly without awns; sessile spikelet 0.65–0.75 cm long; leaves upto 15 × 2 cm.. .. ..*I. goebelii*

I. Goebelii

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Ischaemum diplopogon Hk. f. in Hk. f. FBI 7:129. 1896; C 3:78; Blatter & McCann 14. t. 8; Bor 178; Patel 91:316; Ch & O 242.

30–45 cm tall, glabrous herbs. Leaves 6.5–15 × 0.6–1.5 cm, linear–lanceolate, acuminate. Peduncle solitary, many, from the upper spathe-like sheaths. Racemes usually 2, 2.5–4.5 cm long. Sessile spikelets 0.4–0.6 cm long, awned, with 0.1–0.12 cm long, thick callus. Pedicellate spikelets often imperfect, not awned.

In central and south Gujarat, in moist places or on old walls (Pavagadh).

FLS & FRS : Aug.–Nov.

Ischaemum goebelii Hack in Öst. Bot. Z. 51:149. 1901; Bor 179; S 315. *Ischaemum aristatum* Hack. non L. subsp. *imberbe* Hack. var. *imbricatum* Hack. in DC. Mon. Phan. 6:203. 1889. *Ischaemum imbricatum* (Hack.) Stapf ex Ridley, Fl. Malay. Penin. 5:200. 1925.

Perennial, erect or decumbent and then geniculately ascending, 60–90 cm tall, stout or slender, glabrous herbs. Leaves 8–35 × 0.7–1.3 cm, linear–lanceolate, flat, glabrous or shortly pilose. Racemes 5.5–18 cm long, solitary or 2–3–nate, closely appressed or separate and spreading. Spikelets 0.5–0.7 cm long.

Dangs (Waghai, *RR* 2213).

FLS & FRS : Oct.

Ischaemum indicum (Houtt.) Merrill var. **indicum** subvar. **indicum**; Bor 180. *Ischaemum indicum* (Houtt.) Merrill in Journ. Arn. Arbor. 10:320. 1938; Patel 91:316; Ch & O 241; S & J 56. *Phleum indicum* Houtt. Nat. Hist. (Ser. II) 13:198. t. 90. f. 2. 1782. *Ischaemum ciliare* Retz. Obs. Bot. 6:30. 1791. *Ischaemum aristatum* auct. non L. 1753; FBI 7:126; C 3:476; Blatter & McCann 11. t. 6.

45–60 cm tall, tufted, slender herbs, villous at nodes. Leaves 3.7–15 × 0.4–1.2 cm, linear to linear–lanceolate, flat, hairy. Spike–like racemes 2, 3–10 cm long, spreading or closely appressed to

each other. Spikelets 0.4–0.5 cm long, pedicellate, green, reddish or violet, ovate, obovate or oblong.

Throughout; common.

FLS & FRS : Sep.–Oct.

Ischaemum indicum (Houtt.) Merrill var. **indicum** subvar. **villosum** (Nees) Bor, Grasses of Burma, Ceylon, India and Pakistan 180.1960. *Spodiopogon villosus* Nees in Hk. & Arn. Bot. Beech. Voy. 242. 1838. *Ischaemum ciliare* Retz. var. *villosum* Hack. in DC. Mon. Phan. 6:227. 1889.

South Gujarat (Vyara, Rajpipla); rare.

FLS & FRS : Sep.–Oct.

Ischaemum molle Hk. f. in Hk. f. FBI 7:128. 1896; C 3:477; Blatter & McCann 13; Bor 183; Patel 91:316; Ch & O 242; S & J 56; S 315.

45–90 cm tall, stout herbs, with solid culms. Leaves 15–25 × 0.6–0.8 cm, linear, sparsely hairy. Racemes 1–2, axillary and terminal, 7.5–15 cm long, densely soft–white–villous. Sessile spikelets 0.4–0.5 cm long, awned, pedicellate ones slightly smaller than sessile one and awnless.

Saurashtra and north to south Gujarat (Patel, 1965). (BALA, BARDI)

FLS & FRS : Aug.–Oct.

Ischaemum pilosum (Klein ex Willd.) Wt. in Madras Lit. Sci. Journ. 138. 1835; FBI 7:130; C 3:479; Blatter & McCann 14. t. 9; WI 5:272. t. 143; Bor 183; Patel 91:316. *Andropogon pilosus* Klein ex Willd. Sp. Pl. 4:920. 1806.

45–120 cm tall, tufted, erect or geniculate herbs. Leaves 10–20 × 0.2–0.6 cm, linear, flat, glabrous. Racemes 2–3–fascicled, 8–15 cm long, yellowish–brown or brownish, pilose. Sessile spikelet 0.5–0.7 cm long, lanceolate, with bearded callus, 0.5–1 cm long awn; pedicellate spikelet 0.4–0.5 cm long, usually with shorter awn.

Throughout; not common. (KHEV, DODIU)

FLS & FRS : Sep.–Jan.

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Ischaemum rugosum Salisb. Icon. Stirp. 1. t. 1. 1791; FBI 7:127; C 3:477; Blatter & McCann 12. t. 7; Bor 184; Patel 91:317; Ch & O 242; S & J 56; S 315.

Annuals, 30–45 cm tall, tufted. Leaves 8–15×0.4–1.5 cm, narrowly linear to linear-lanceolate, flat. Racemes 2.5–4 cm long, terminal, solitary or paired, brown. Spikelets 0.4–0.5 cm long, glabrous.

Throughout except Kutch; common.

FLS & FRS : Sep.–Nov.

Ischaemum santapaui Bor in Journ. Bombay nat. Hist. Soc. 49:167. 1950; Bor 185.

Annuals, 100–120 cm tall, robust, branching at nodes. Leaves 15–20 × 1–1.2 cm, linear-lanceolate, glabrous or silky-hairy. Racemes 6–8 cm long, paired, at the tip of glabrous peduncle. Spikelets 0.4–0.5 cm long, with villous callus.

Dangs, in forest undergrowth (*HS* 20064); rare.

FLS & FRS : Oct.

Ischaemum semisagittatum Roxb. Hort. Beng. 8. 1814 (nomen) & Fl. Ind. 1:322; 1832; FBI 7:130; C 3:479; Blatter & McCann 15. t. 10; Bor 185; Patel 91:317.

30–60 cm tall, ascending from a decumbent base, glabrous annuals. Leaves 5–7.5 × 1–1.6 cm, oblong-lanceolate, broadly cordate or sagittate at base. Racemes 2, more or less softly villous, 2.5–6.5 cm long. Sessile spikelet 0.4–0.6 cm long, awned; pedicelled spikelets shorter and narrower, appressed to sessile ones.

South Gujarat growing in shaded spots (Patel, 1965).

FLS & FRS : Sep.–Oct.

Ischaemum timorense Kunth, Rev. Gram. 1:369. 1830; FBI 7:136; Blatter & McCann 19; Bor 185.

Straggling, slender herbs, 15–45 cm tall, with glabrous or sparsely hairy nodes. Leaves 2.5–10×0.3–0.5 cm, linear-lanceolate, glabrous or sparsely hairy. Spikes 2–3, 1–3(–8) cm long, slender, sparingly villous. Spikelets 0.25–0.3 cm long, with long-bearded callus.

Dangs (Waghai, *RR* 2226).

FLS & FRS : Nov.

ISEILEMA Anderss.

Key to species

1. Tubercles not present on the spatheoles or spikelets; nodes, at least the lower, glabrous :

   2. Pedicels of involucral spikelets as broad as long, hairy on the margin; lower glumes of the hermaphrodite spikelets humped or convex below, appressed hairy at the base or glabrescent and ciliate on the margins in the lower quarter; beak as long as the lower elliptic portion; involucral spikelets, 0.45–0.65 cm long, long-ciliate on the margins .. .. *I. anthephoroides*

   2. Pedicels of involucral spikelets longer than they are broad at the apex; lower glume of hermaphrodite spikelet glabrous at the base, appressed-hairy above and eciliate on the margin below; beak not as long as lower elliptic portion; involucral spikelets 0.4 cm long.. .. *I. laxum*

1. Tubercles present on the spatheoles and/or on the margins of the involucral spikelets :

   3. Lower glume of hermaphrodite spikelet convexly humped, appressed-hairy at base and ciliate on margins in the basal quarter; nodes glabrous; beak as long as the lower elliptic portion.. .. .. *I. anthephoroides*

   3. Lower glume of hermaphrodite spikelet flat or depressed longitudinally, glabrous and eciliate in the lower quarter, nodes bearded.. .. .. *I. prostratum*

I. Prostratum

Scanned by CamScanner

Iseilema anthephoroides Hack. in DC. Mon. Phan. 6:683. 1889; FBI 7:219; Blatter & McCann 112. t. 72; Bor 187; Patel 91:317; Ch & O 248.

A much tufted annual, very leafy below, 30–45 cm high. Leaves 0.8–1.5×0.2–0.5 cm, scabrid on margins, ciliate at base and tip. Panicles long, interrupted by spatheoles. Involucral spikelets broadly oblong, 0.4 cm long, sparsely hairy, minutely pedicellate. Sessile spikelet 0.5–0.6 cm long, hispidly hairy.

In moist places in Gujarat (Patel, 1965).

FLS & FRS : Aug.–Oct.

Iseilema laxum Hack. in DC. Mon. Phan. 6:682. 1889; FBI 7:218; C 3:517; Blatter & McCann 173; WI 5:273. t. 144; Bor 188; Patel 91:317; S & J 56.

45–90 cm tall, slender, tufted, perennial herbs. Leaves 3–13.5 cm long, linear, flat. Racemes of distant, axillary, pedunculate, 0.6–1.3 cm long, spathaceous fascicles. Spikelets 0.4–0.5 cm long, male whorled, oblong–lanceolate, bisexual spikelets narrowly lanceolate.

Throughout; common,

FLS & FRS : Aug.–Oct.

Iseilema prostratum (L.) Anderss. in Nov. Act. Soc. Sci. Upsal (Ser. 3.) 2:251. 1856; Bor 188; Patel 91:317; S & J 56. *Andropogon prostratus* L. Mant. Alt. 304. 1771. *Andropógon wightii* Nees ex Steud. Syn. Pl. Glum. 1:400. 1855. *Iseilema wightii* Anderss. in Nov. Act. Soc. Sci. Upsal. (Ser. 3.) 2:251. 1856; FBI 7:218; C 3:516; Blatter & McCann 113. t. 73.

45–60 cm tall, geniculately ascending perennials. Leaves 2.5–15 × 0.2–0.4 cm, linear to linear–lanceolate, flat, scabridly ciliate. Racemes of distant, axillary, pedunculate fascicles, 0.8–1.2 cm long.

Throughout (except Kutch); not common.

FLS & FRS : Aug.–Nov.

LEPTOCHLOA P. Beauv.

Key to species

1. Florets 2, rarely 3; glumes unequal; lower less than 0.1 cm long; upper 0.12–0.14 cm long; racemes very slender 2.5–6 cm long.. .. ..*L. panicea*
1. Florets usually 3–6 (2–7); glumes unequal, lower 0.12–0.2 cm long, the upper 0.15–0.25 cm long; racemes thick, 5–10 cm long... .. ..*L. chinensis*

Leptochloa chinensis (L.) Nees in Syll. Ratisb. 1:4. 1824; FBI 7:299; Blatter & McCann 244; Bor 516; Patel 91:335. *Poa chinensis* L. Sp. Pl. 69. 1753.

Stout, 60–90 cm tall, erect or geniculately spreading herbs. Leaves 15–45 cm long, flat or convolute, scabrulous, Panicles 15–25 cm long, with slender, opposite or alternate, suberect or spreading branches, 5–10 cm long, Spikelets 0.2–0.25 cm long, 4–6–flowered, alternate, shortly pedicelled.

Kutch and north to south Gujarat in wet places. (Patel, 1965). (JHIRIU)

FLS & FRS : Sep.–Nov.

Leptochloa panicea (Retz.) Ohwi in Bot. Mag. Tokyo 55:311. 1941; Bor 517; Patel 91:336; S & J 56. *Poa panicea* Retz. Obs. Bot. 3:11. 1783. *Leptochloa filiformis* auct. non P. Beauv.; FBI 7:298.

Annual, tufted, geniculately ascending slender, glabrous, 30–90 cm tall herbs. Leaves 10–25×0.8–1 cm, flat, finely acuminate. Panicles 10–22 cm long, contracted or diffuse, with many capillary branches. Spikes 3–10×0.2–0.3 cm, ascending or spreading. Spikelets very small, 2–4–flowered.

According to Patel (1965) it occurs throughout (except Kutch) as a weed in moist places and cultivated fields; also listed by Saxton & Sedgwick (1918) from Ahmedabad.

FLS & FRS : Aug.–Dec.

Scanned by CamScanner

LOPHOPOGON Hack.

Lophopogon tridentatus (Roxb.) Hack. in Engl. & Prantl, Pfam. (II) 2:26. 1887; FBI 7:149; C 3:484; Blatter & McCann 28. t. 19; Bor 190; Patel 91:317. *Andropogon tridentatus* Roxb. Fl. Ind. 1:257. 1820.

A perennial, slender, densely tufted herb, 10–20 cm tall. Leaves 5–10×1–1.5 cm, narrowly linear, rigid, erect. Heads of racemes erect, ovoid. Racemes two, 1.3–2 cm long, closely appressed, erect, pilose. Spikelets 0.4–0.5 cm long, closely imbricate ovate to ovate-oblong, awned.

Listed by Patel (1965) from Gujarat, as growing in moist places.

FLS & FRS : Sep.–Nov.

MANISURIS L.

Manisuris clarkei (Hack.) Bor apud Santapau, Rec. bot. Surv. India 16(1) : 357. 1953; Bor 191; Patel 91:317. *Rottboellia clarkei* Hack. in Oest. Bot. Zeitsch. 41:8. 1891; FBI 7:156; C 3:472; *Coelorhachis clarkei* (Hack.) Blatter & McCann in Journ. Bombay nat. Hist. Soc. 32:33. 1927 & Bombay Grasses 41. t. 29. 1935.

20–60 cm tall, erect annuals, glabrous but for a ring of hairs at node. Leaves 10–15 × 0.8–1.3 cm, linear-lanceolate, scabrous or more or less hairy, hairs tubercled base. Racemes solitary, 1.3–3 cm long, pale-yellow, subtended by a spathe; rachis, very fragile. Sessile spikelets 0.25–0.3 cm long, obtuse, closely imbricating with a short but broad cylindric callus.

In shaded places in south Gujarat (Patel, 1965).

FLS & FRS : Sep.–Oct.

MELANOCENCHRIS Nees

Melanocenchris jacquemontii J. & S. Ill. Pl. Or. 4:36. t. 325. 1851; WI 6:321. t. 109; Bor 473; Patel 91:331; Ch & O 260; S & J 56; S 316. *Melanocenchris royleana* Nees ex Steud. Syn. Pl. Glum. 1:218. 1854. *Gracilea royleana* Hk. f. in Hk. f. FBI 7:284. 1896; C 3:553; Blatter & McCann 248. t. 165.

5–15 cm tall, densely tufted, slender annuals. Leaves 2.5–5 cm long, narrowly linear-lanceolate or ensiform, flat or convolute. Racemes 3.5–7 cm long. Cluster of spikelets 0.4–0.6 cm long (including awns), greenish-white, at times tinged violet, at length silvery-white.

Throughout, common, particularly in stony or rocky soil.

FLS & FRS : Aug.–Dec.

OPHIUROS Gaertn. f.

Ophiuros exaltatus (L.) O. Ktze. Rev. Gen. Pl. 2:780. 1891; Bor 199; Patel 91:318; S & J 56. *Aegilops exaltatus* L. Mant. 2:575. 1771. *Rottboellia corymbosa* L. f. Suppl. 114. 1781. *Ophiuros corymbosus* (L. f.) Gaertn. f. Fruct. 3:4. t. 181. f. 3b. 1805; FBI 7:160; C 3:468; Blatter & McCann 40. t. 28.

90–150 cm tall, slender, rhizomatous herbs. Leaves 6–30× 0.5–1 cm, flat, linear. Racemes 7.5–20 cm long, solitary or 5–10 fascicled, pale-greenish-yellow, erect, rigid, cylindric. Spikelets 2-nate, placed laterally and anticously on nodes.

Throughout (except Kutch); occasional.

FLS & FRS : July–Dec.

OPLISMENUS P. Beauv.

Key to species

1. Awn smooth, viscid, filiform, stiff, often reddish . . *O. compositus*
1. Awn barbellate, capillary, often flexuous, usually pale . . . . . *O. burmannii*

Oplismenus burmannii (Retz.) P. Beauv. ESS. Agrost. 54 & 168–169. 1812; FBI 7:68; C 3:443; Blatter & McCann 154. t. 97; WI 7:88. t. 43; Bor 317; Patel 91:324; Ch & O 252; S & J 56; S 316. *Panicum burmannii* Retz. Obs. Bot. 3:10. 1783.

Scanned by CamScanner

Slender, simple or branched, 25–60 cm tall herbs. Leaves 1–7×0.2–1.2 cm, ovate-lanceolate, glabrous or sparingly pilose. Panicles 8–10 cm long, terminal, of 1–2 cm long spikes. Spikelets 0.2–0.3 cm long (excluding awn), oblong or lanceolate.

Throughout in shaded spots; common.

FLS & FRS : Aug.–Dec.

Oplismenus compositus (L.) P. Beauv. Agrost. 54. 1812; FBI 7:66; C 3:442; Blatter & McCann 152. t. 96; Bor 312; Patel 91:324; S 317.

A very slender, branched, 30–60 cm long herb, creeping below, with geniculately ascending branches. Leaves 5–15×1.3–2 cm, ovate to ovate-lanceolate, thin, flat, glabrous or hairy. Panicles 7–25 cm long, of distant, 2.5–7 cm long spikes. Spikelets distant, 0.35–0.4 cm long (excluding awn), lanceolate-ellipsoid.

In south Gujarat in forest undergrowth; not common.

FLS & FRS : Aug.–Oct.

OROPETIUM Trin.

Oropetium thomaeum (L. f.) Trin. Fund. Agros. 98. t. 3. 1820; FBI 7:366; C 3:568; Blatter & McCann 247; Bor 474. *Nardus thomaea* L. f. Suppl. 105. 1781.

Very tiny herbs, 5–7.5 cm tall, often forming tufts. Leaves as long as or shorter than stem, erect or curved, filiform, coriaceous, sprasely hairy. Spikes 2.5–4 cm long, erect, straight or curved with 4-gonous rachis. Spikelets 0.2–0.25 cm long, 1-flowered.

North Gujarat (Idar, Phada, Mahudi, Mansa); rare.

FLS & FRS : Aug.–Feb.

ORYZA

Key to species

1. Ligule of the lower leaves very long, 15–45 cm long :
   2. Spikelets persistent... .. ..*O. sativa*

   2. Spikelets caduous.. .. ..*O. nivara*

1. Ligule of the lower leaves much shorter, not more than 6 mm long.. ... . *O. minuta*

Oryza minuta J S. Presl. ex C.B. Presl, Rel. Haenk. 1:208. 1830; Bor 605. *Oryza latifolia* Hk. f. in Hk. f. FBI 7:92. 1896 non Desv. 1813.

45–75 cm tall herbs. Leaves 16–30 × 1.5–1.8 cm, linear, flat. Panicles 4–10 cm long, terminal. Spikelets 0.4–0.5 cm long, ovate-oblong or ovoid.

Dangs (Waghai–Pimpri Road and along Nasik road).

FLS & FRS : Oct.

Oryza nivara Sharma & Shashtri in Ind. Journ. Genetics & Pl. Breeding 25 (2):161. 1965; S & J 56. *Oryza sativa* L. var. *fatua* Prain, Bengal. Pl. 1184. 1903. *Oryza rufipogon* Griff. Notul. 3:5. 1851 & Icon. Pl. AS. 3:t. 144. f. 2. 1851; Bor 605.

Annual herbs, 60–90 cm tall. Leaves 15–30×0.8–1.2 cm, linear, flat, scabridly hairy. Panicles 8–20 cm long, effuse. Spikelets 0.7–0.8 cm long, scabrid, pale-green. Awns 4.5–8 cm long, coarsely scabrid, pale-brown.

Saurashtra and Panchmahals (Tuwa); locally abundant.

FLS & FRS : Aug.–Oct.

Oryza sativa L. Sp. Pl. 333. 1753; FBI 7:93; C 3:565; Blatter & McCann 274. t. 187; WI 7:222. t. 95; Bor 605; Patel 91:336; S & J 56.

75–100 cm tall herbs. Leaves 12–50×0.5–1.8 cm, linear, flat, scabrid on margins and on nerves beneath. Panicles 10–25 cm long, lax, at length drooping. Spikelets 0.6–1 cm long, ovate-oblong or ovoid, pale-brown at maturity.

Cultivated. (BHAT, CHOKHA)

FLS & FRS : Aug.–Nov.

Scanned by CamScanner

PANICUM L.

Key to species and varieties

1. Lemma of upper floret finely transversely rugose; nerves of the upper glume and lower lemma obscure.. ...*P. maximum*
1. Lemma of the upper floret quite smooth; nerves of upper glume and lower lemma definite, conspicuous :
   2. Spikelets 0.4–0.5 cm long, sharply acute, ovate to elliptic in back view :
      3. Leaf-sheaths hairy; spikelets persistent.. ..*P. miliaceum*
      3. Leaf-sheaths glabrous; spikelets deciduous..*P. turgidum*
   2. Spikelets 0.15–0.3 cm long, rarely upto 0.4 cm long and if so, with narrow lanceolate spikelets :
      4. Lower glume cuspidate or cuspidate-acuminate.. .. ..*P. trypheron*
      4. Lower glume not cuspidate-acuminate :
         5. Spikelets narrowly lanceolate to lanceolate-oblong, acute.. .. ..*P. paludosum*
         5. Spikelets oblong, ovate-oblong to elliptic, acute or obtuse :
            6. Lower glume one-quarter to half the length of the spikelet :
               7. Nodes and leaf-sheaths hairy.. ...*P. miliaceum*
               7. Nodes and leaf-sheaths glabrous :
                  8. Annuals :
                     9. Spikelets persistent; panicle contracted, 4–14 cm long; lower glume orbicular, apiculate.. .. ..*P. sumatranse*
                     9. Spikelets deciduous; panicle effuse; lower glume ovate-apiculate :
                        10. Spikelets greenish..*P. psilopodium* var. *psilopodium*
                        10. Spikelets purple .. *P. psilopodium* var. *coloratum*
            6. Lower glume one-half to three quarters the length of spikelets or more :
               11. Spikelets obtuse .. .. .. *P. notatum*
               11. Spikelets acute .. .. .. *P. antidotale*

Panicum antidotale Retz. Obs. Bot. 4:17. 1786; FBI 7:52; C 3:453; Blatter & McCann 163. t. 104; Bor 322; WI 7:222. f. 95; Patel 91:324; S & J 56.

Perennial herbs, 90–120 cm tall, stout. Leaves 30–45 × 1.5–2 cm, linear, flat, glabrous. Panicles 20-32 cm long, effuse, pyramidal, usually with fascicled branches. Spikelets 0.2–0.25 cm long, laxly crowded on branchlets, ovate.

Throughout, not very common. (DHUN, DHUNSADO)

FLS & FRS : Sep.–Dec.

Panicum maximum Jacq. Coll. Bot. 1:76. 1786 & Ic Pl. Rar. 1:2. t. 13. 1781–86; FBI 7:49; C 3:455; Blatter & McCann 161. t. 103; Bor 327; Patel 91:324; S & J 56.

A perennial, densely tufted grass, 1.5–3 m tall, erect or geniculately suberect, stout, simple or branched. Leaves 10–60 × 4–18 cm, hirsute, linear, flat, scabrous or spinulosely scabrid. Panicles erect and nodding, 10–45 cm long; primary branches whorled, 2.5–7.5 cm long. Spikelets 0.35–0.4 cm long.

Cultivated as cattle fodder; native of tropical and south Africa. (GINI–GHAS)

FLS & FRS : Aug.–Nov.

Panicum miliaceum L. Sp. Pl. 58. 1753; C 3:456; Blatter & McCann 159. t. 100; Bor 327; Patel 91:325.

Tufted annuals, upto 1 m tall, erect or geniculately ascending, slender or stout, simple or sparingly branched, more or less softly hirsute below nodes. Leaves 15–39 × 0.6–2 cm, linear, glabrous but for ciliate lower margins. Panicles contracted and dense or open upto 30 cm long. Spikelets 0.45–0.5 cm long, ovate-oblong to ovate-lanceolate, turgid, acuminate.

Cultivated in Gujarat at some places as kharif crop. (VARAI, BHAGAR, CHENA, MORAIYO)

FLS & FRS : Aug.–Oct.

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Panicum notatum Retz. Obs. Bot. 4:18. 1786; S & J 56; S 317. *Panicum montanum* Roxb. Fl. Ind. 1:315. 1820; FBI 7:53; C 3:454; Blatter & McCann 164. t. 105. Bor 329; Patel 91:325.

1 m or more tall, erect, from a woody root-stock, with glabrous, solid culms. Leaves 12.5–20 × 1.3–3 cm, linear-oblong, flat, smooth, glabrous or ciliate near the base only. Panicle 20–38 cm long, effuse, copiously branched. Spikelets 0.25–0.3 cm long, ellipsoid, obtuse.

Throughout (except Kutch). (NARHALI)

FLS & FRS : Aug.–Dec.

Panicum paludosum Roxb. Fl. Ind. 1:310. 1820; Blatter & McCann 162; Bor 329. *Panicum proliferum* auct. non Lam.; FBI 7:50. *Panicum proliferum* Lam. var. *paludosum* Stapf in Dyer, Fl. Cap. 7:407. 1899; C 3:454.

Perennial, simple or branched, 45-75 cm tall herbs, with basally geniculate culms. Leaves 15–30 × 0.6-1.7 cm, linear or ensiform, flat, glabrous. Panicle 10-25 cm long, lower branches whorled or fascicled. Spikelets 0.3–0.4 cm long, narrowly ovoid-lanceolate.

Dangs (Subir, *BS* 1440; deposited at FRI herbarium).

FLS & FRS : Aug.

Panicum psilopodium Trin. var. **coloratum** Hk. f. in Hk. f. FBI 7:47. 1896; Bor 330.

Very similar to var. *psilopodium* but spikelets are purple.

South to north Gujarat; rather rare.

FLS & FRS : Aug.–Oct.

Panicum psilopodium Trin. var. **psilopodium**; Bor 329. *Panicum psilopodium* Trin. Gram. Panic. 217. 1826; FBI 7:46; Blatter & McCann 158; Bor 329; Patel 91:325; Ch & O 250.

30–45 cm long, slender, tufted, erect or basally geniculate herbs. Leaves 5-21 × 0.3–0.9 cm, flat, linear, glabrous. Panicles 5–20 cm or more long, open, with capillary branches. Spikelets 0.2–0.25 cm long, geminate on slender pedicel.

North to south Gujarat in moist, shaded areas; occasional. (MOR-DANURO)

FLS & FRS : Aug.–Dec.

Panicum sumatranse Roth ex R. & S. Syst. Veg. 2:434. 1817; Bor 201 & in Fedde Repert. 63:328. 1960; WI 7:229. t. 98; S & J 56. *Panicum miliare* Lam. Tab. Encycl. 1:175. 1791. (nom. illegit.); FBI 7:46; C 3:456; Bor 329; Blatter & McCann 160. t. 101; Patel 91:325.

Up to 1 m tall, slender, erect or basally geniculate, simple or branched herbs. Leaves 15–60 × 1.2–2.5 cm, ovate-lanceolate, glabrous or finely hairy. Panicles decompound, contracted or often nodding, 15–25 cm long. Spikelets glabrous, flattened, often solitary at ends of branchlets, lanceolate or broadly elliptic-ovate.

Cultivated at some places. (VARAI, HACKI-VARAI, VAGAD)

FLS & FRS : Aug.–Oct.

Panicum trypheron Schult. Syst. Veg. 2. Mant. 244. 1824; FBI 7:47; C 3:452; Bor 331; Patel 91:325; S & J 57. *Panicum tenellum* Roxb. Hort. Beng. 7. 1814 (nomen) & Fl. Ind. 1:309. 1820 (non Lam. 1791).

30–60 cm tall, tufted, erect or basally geniculate, glabrous, leafy herbs. Leaves 7.5–25 × 0.3–0.6 cm, flat, linear, more or less hairy on both surfaces. Panicles 10–25 cm long and often as much broad, effuse, with filiform branches, 6–10 cm long. Spikelets 0.25–0.3 cm long, distant, ovoid, acuminate, glabrous.

In sandy waste lands at Saurtshtra and north Gujarat.

FLS & FRS : Aug.–Nov.

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Panicum turgidum Forsk. Fl. Aegpt.-Arab. 18.1775; FBI 7:44; C 3:451; Blatter & McCann 156; t. 98; Bor 331; Patel 91:325; S & J 57.

Perennial, glabrous herbs, with solid and polished culms from stout, root-stock. Leaves 0.25-0.75 cm long, flat, linear-lanceolate, acuminate. Panicle terminal, subpyramidal, 3.8-10 cm long, with branches 1.3-4 cm long. Spikelets 0.3-0.4 cm long, solitary, rarely, 2-nate, subsecund, ovoid, turgid.

Kutch and Saurashtra on sandy soils.

FLS & FRS : Aug.-Nov.

PASPALIDIUM Stapf

Key to species

1. Spikes shorter than the internodes.. .. ..*P. flavidum*
1. Spikes longer than the internodes :
   2. Perennials; rachis of the spike produced into a sharp point; upper glume half-length of upper lemma or more; upper lemma rugulose.. .. .. ..*P. punctatum*
   2. Annuals; rachis of the spike not produced into a sharp point; upper glume nearly as long as the upper lemma; upper lemma granular.. .. .. ..*P. geminatum*

Paspalidium flavidum (Retz.) A. Camus in Lecomte Fl. Gen. de l' Indo-China 7:419. 1922; Blatter & McCann 141. t. 90; Bor 333; Patel 91:325; WI 7:268. t. 117; Ch & O 252; S & J 57; S 317. *Panicum flavidum* Retz. Obs. Bot. 4:15. 1786; FBI 7:28; C 3:445.

Perennial herbs, 60–100 cm tall, slender, tufted, erect or ascending, from decumbent base. Leaves 20-45×0.8-1.5 cm, linear, glabrous. Racemes 10-45 cm long, of 3-15, 2-2.5 cm long spikes. Spikelets glabrous, biseriate, at length pale-straw coloured.

Throughout; common. (JINKO-SAMO, GORIU, JANGLI-BERVAT)

FLS & FRS : July-Oct.

Paspalidium geminatum (Forsk.) Stapf in Prain, Fl. Trop. Afr. 9:583. 1920; Blatter & McCann 142; Bor 333; Patel 91:325; S & J 57. *Panicum geminatum* Forsk. Fl. Aegpt.-Arab. 18. 1775. *Panicum fluitans* Retz. Obs. Bot. 3:8. 1783; C 3:446. *Panicum paspaloides* Pers. Syn. 1:81. 1805; FBI 7:30.

Perennial herbs, tufted, from stout, creeping base. Leaves 5–10×0.4–0.6 cm, linear, flat, glabrous. Racemes 5–15 cm long, of 8–10, 2–2.2 cm long, distant spikes. Spikelet ± 0.2 cm long, ovoid, glabrous.

Throughout; common.

FLS & FRS : Aug.–Nov.

Paspalidium punctatum (Burm. f.) A. Camus in Lecomte, Fl. Gen. de l'Indo-Chine 7:419. 1922; Blatter & McCann 142. t. 91; Bor 333; Patel 91:326. *Panicum punctatum* Burm. f. Fl. Ind. 26. 1768; FBI 7:29; C 3:445.

Perennial herbs; culm 0.6–1 m long, creeping in mud or floating in shallow water. Leaves 10-20×0.6–1 cm, linear. Spikes many, 1.3–2.5 cm long, distant, sessile, longer than internodes. Spikelets 0.25–0.3 cm long, imbricate, 2-seriate ovoid-oblong.

Gujarat, in moist areas and in water (Patel, 1965).

FLS & FRS : Aug.–Nov.

PASPLUM L.

Key to species

1. Spikelets arranged in four rows.. .. ..*P. longifolium* var. *longifolium*
1. Spikelets arranged in two rows :
   2. Spikelets upto 0.12–0.13 cm long.. .. ..*P. compactum*
   2. Spikelets much longer; if less than 0.2 cm long, ciliate on the margins :
      3. Spikelets broadly elliptic or ovate-elliptic, acute :

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4. Upper glume glabrous; lower lemma not prominently nerved; racemes upto 4 cm long; prostrate, rooting at nodes.. .. ..*P. vaginatum*

4. Upper glume pubescent; lower lemma prominently nerved; racemes more than 4 cm long; erect or decumbent but not rooting at nodes.....*P. distichum*

3. Spikelets rotundate–elliptic, broadly obovate–elliptic to almost orbicular, obtuse.. .. ..*P. scrobiculatum*

Paspalum compactum Roth, Nov. Pl. Sp. 36. 1821; FBI 7:12; C 3:460; Blatter & McCann 138. t. 88; Bor 336; S 318.

15–30 cm tall, leafy herbs. Leaves 2.5–7.5×0.8–1.3 cm, elliptic–lanceolate, hairy. Spikes numerous (often horizontally spreading), glabrous or nearly so, forming a pyramidal raceme, 5–10 cm long. Spikelets 0.12–0.16 cm long, hemispheric, close set, but not imbricate.

Dangs–Malegaon (*BS* 1892; specimen deposited at FRI herbarium).

FLS & FRS : Sep.

Paspalum distichum L. Syst. Nat. (ed. 10) 2:855. 1759: FBI 2:12; C 3:460; Bor 338; S & J. 57.

Perennials, rhizomatous grass with long stolons forming lpose mats. Leaves 6.5–10×0.3–0.5 cm, linear, glabrous. Racemes 2–3, 2.5–5 cm long, terminal, erect or spreading. Spikelets 0.25 –0.35 × 0.15–0.2 cm, broadly elliptic.

North Gujarat and Saurashtra, in moist ground.

FLS & FRS : Oct.

Paspalum longifolium Roxb. Fl. Ind. 1:283. 1820 var. **longifolium**; Bor 339; Patel 91:326. *Paspalum scrobiculatum* L. var. *longifolium* (Roxb.) Dom. in Bibl. Bot. 85: 287. 1915.

Very similar to *P. scrobiculatum* L. but spikelets are arranged in four rows upon a broad rachis whereas in *P. scrobiculatum* L. they are in two rows.

Gujarat, in cultivated areas (Patel, 1965).

FLS & FRS : Aug.–Sep.

Paspalum scrobiculatum L. Mant. 1:29. 1767; FBI 7:10 (excl. syn. *P. orbiculare* Forsk.); C 3:460; Blatter & McCann 136. t. 87; WI 7:270. t. 118; Bor 340; Patel 91:326; S & J 57; S 318.

Annuals, 30–45 cm tall, tufted, erect or ascending from a decumbent base. Leaves 8–35 × 0.3–1 cm or sometimes more, linear to linear–lanceolate, flat, glabrous. Racemes 2–6, 1–6 cm long, subdigitate. Spikelets 0.2–0.3 cm long, brown, secund, biseriate.

Cultivated; also an escape. (KODRO, KODRI, MANIA–KODRA)

FLS & FRS : Aug.–Oct.

Paspalum vaginatum Sw. Proc. Veg. Ind. Occ. 21.1788; Bor 341; S & J 57.

Included on the authority of Santapau & Janardhanan (1967); Saurashtra.

PENNISETUM Rich.

Key to species

1. Lemmas more or less alike; lower lemma not 3–lobed; upper floret not deciduous; rachis not conspicuously ribbed; rib not winged :

2. Anther cells bearded at apex :

3. Perennials; usually wild; spikelet solitary, not gapping; bristles 1–1.8 cm long.. .. .. ..*P. purpureum*

3. Annuals; usually cultivated, seldom an escape; Spikelets crowded, gapping and exposing the grains; bristles not more than 0.7 cm long.. .. ..*P. typhoides*

2. Anther cells not bearded at apex :

4. Rachis of spikes villous or woolly.. .. *P. purpureum*

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4. Rachis of spikes glabrous, often scabrid :

5. Lower glume minute or absent, not more than 0.15 cm long . .. . *P. hohenackeri*

5. Lower glume half to three-quarters the length of the spikelet, at any rate over 0.17 cm long.. .. .. *P. divisum*

1. Lemmas heteromorphous; lower lemma often 3-lobed; upper floret readily disarticulating; rachis with decurrent wings on the ribs below pedicels :

6. Spikelets solitary and pedicelled or in groups of 2-5, with one sessile and others pedicelled; lower glume at least half the length of the lower lemma.. .. *P. pedicellatum*

6. Spikelets sessile, solitary; lower glume minute or small, rarely, if ever, half as long as the lower lemma.. *P. setosum*

Pennisetum divisum (Forsk. ex Gmel.) Henr. in Blumea 3:162. 1938 (in Obs.); Bor 343; Patel 91:326. *Panicum divisum* Forsk. ex Gmel. Syst. Nat. 2:156. 1791. *Panicum dichotomum* Forsk. Fl. Aegpt.-Arab. 20. 1775 non L. 1753. *Pennisetum dichotomum* (Forsk.) Del. Fl. Egypte t. 8. f. 1. 159. 1813; FBI 7:85; C 3:430; Blatter & McCann 179. t. 114.

Glabrous, bushy, dichotomously branched perennials. Leaves 7.5-15×0.2-0.4 cm, narrowly linear. Racemes 6.3-12.5 cm long, cylindric, pale (nearly white). Spikelets usually solitary, 0.8 cm long, lanceolate.

Kutch and Gujarat in sandy, stony or rocky ground (Patel, 1965). Dalzell & Gibson (*Bombay, Fl.* p. 294. 1861) cite loc. Gujarat in hedges under *Cenchrus ramosissimus* Poir.

FLS & FRS : Aug.-Oct.

Pennisetum hohenackeri Hochst. ex Steud. Syn. Pl. Glum. 1:103. 1854; Bor 344; Patel 91:326. *Pennisetum alopecuros* auct. non Jacq.; FBI 7:84; C 3:430; Blatter & McCann 178. t. 113.

Perennial herbs, 75-120 cm tall, stout, tufted. Leaves 4-30× 0.4-1 cm, flat, linear. Racemes spike-like, 8-15 cm long. Spikelets 0.6-0.8 cm long, lanceolate; bristles unequal, longest 2-3 times longer than spikelet, all scabrulous.

North to south Gujarat; common to occasional in areas of occurrence. (MORTHUTHLI)

FLS & FRS : Aug.-Nov.

Pennisetum pedicellatum Trin. in Mem. Acad. Sci. Petersb. (Ser. VI) 3:184. 1834; FBI 7:86; C 3:431; Blatter & McCann 180. t. 115; Bor 346; Patel 91:326.

30-90 cm tall annuals, branched from base and above. Leaves 15-25×0.4-1 cm, flat, flaccid, glabrous or sparsely hairy. Racemes 5-12.5 cm long, cylindric; involucel sessile; inner bristles numerous, 1 cm or more long. Spikelets 0.4 cm long, shortly pedicellate, usually solitary, within the involucel.

Throughout (except Kutch) in drying moist areas.

FLS & FRS : Aug.-Sep.

Pennisetum purpureum Schum. Beskr. Guin. Pl. 44. 1827; Blatter & McCann 184; Bor 348. f. 40.

Perennials with creeping rhizomes, tufted, 1.5-2.5 m tall. Leaves 30-60×2-2.5 cm, linear. Inflorescence a dense, cylindric spike, 8-20 (-30) cm long and 1.5-3 cm in diameter, yellow or yellowish-brown or purple or nearly black, made up of deciduous spikelets or fascicles of spikelets subtended by an involucre of numerous, unequal bristles, 0.5-0.8 (1.2-2) cm long. Spikelets solitary, sessile if in fascicles of 4, two laterals pedicelled, 0.5-0.7 cm long, lanceolate.

This plants is native of Tropical Africa; it is cultivated in Dangs (Bhavandagad) as forage for cattle (BS 491; specimen deposited at FRI herbarium, Dehdradum).

FLS & FRS : Oct.

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Ponnisetum setosum (Sw.) L. C. Rich. in Pers. Syn. Pl. 1:72. 1805; FBI 7:87; C 3:431; Blatter & McCann 180; Bor 348; Patel 91:327 *Cenchrus setosus* Sw. Prodr. Veg. Ind., Occ. 26. 1768

Annuals, erect, fastigiately branched at nodes. Leaves 15–25×0.6–1 cm, linear, finely acuminate, glabrous or hairy. Racemes 5–10 cm long, usually purplish-brown; bristles unequal. Spikelets 0.4 cm long, solitary, within involucel.

Kutch and north Gujarat.

FLS & FRS : Aug.–Sep.

Pennisetum typhoides (Burm. f.) Stapf & Hubb. in Kew Bull. 1933; 271. 1933; Bor 350; WI 7:296. Pl. 9 & ff. 129–130, 132; Patel 91:327; Ch & O 254; S & J 57; S 318. *Alopecuros typhoides* Burm. f. Fl. Ind. 27. 1768. *Pennisetum typhoideum* A. Rich. in Pers. Syn. 1:72. 1805 (p. p.); FBI 7:82; C 3:432. *Pennisetum spicatum* R. & S. Syst. Veg. 2:499. 1817; Blatter & McCann 182. t. 117.

1–2 m tall, stout, simple or branched, annuals. Leaves 10–40×0.8–2 cm, linear to linear-lanceolate, glabrous or hairy, Spikes 7–25×1–2.5 cm, cylindric, terminal, pale-brown. Spikelets 0.3–0.4 cm long.

Cultivated in many parts of Gujarat; also an escape in waste places. (BAJRI, BAJRO)

FLS & FRS : Aug.–Nov. and Mar.–May

PEROTIS Ait.

Perotis indica (L.) O. Ktze. Rev. Gen. Pl. 3:787. 1891; Blatter & McCann 220. t. 147; Bor 611. t. 72; Patel 91:337. *Anthoxanthum indicum* L. Sp. Pl. 28. 1753. *Perotis latifolia* Ait. Hort. Kew. 1:85. 1789; FBI 7:98; C 3:538.

30–45 cm tall, slender, erect or suberect herbs. Leaves 3–5.5×0.5–0.6 cm, lanceolate to ovate-lanceolate, glabrous, flat. Spike 10–15 cm along, compact, violet-purple. Spikelets ± 0.2 cm long, subterete, narrowly linear, scabrous.

North to south Gujarat; occasional.

FLS & FRS : Aug.–Oct.

PHRAGMITES Trin.

Phragmites karka (Retz.) Trin. ex Steud. Nom. Bot. (ed. 2) 2:324. 1841; FBI 7:303; C 3:527; Bor 416; Patel 91:329; S & J 57. *Arundo karka* Retz. Obs. bot. 4:21. 1786. *Phragmites maxima* Blatter & McCann, Bombay Gr. 202. 1935 (non *Arundo maxima* Forsk.).

Stout, 1.5–3 m tall, simple or branched, erect herbs. Leaves 8–30×0.4–0.8 cm long, close, bifarius, linear, coriaceous. Panicle ample, 45–60 cm long, erect, oblong, branches widely spreading. Spikelets 1.2–1.3 cm long, ovate-lanceolate or ovate-linear, on smooth, capillary pedicels.

Throughout, commonly along river banks, seldom in hedges.

FLS & FRS : Sep.–Feb.

POLYPOGON Desf.

Polypogon monspeliensis (L.) Desf. Fl. Atlant. 1:67. 1798; FBI 7:245; Blatter & McCann 207. t. 137; Bor 403. *Alopecuros monspeliensis* L. Sp. Pl. 61. 1753.

Annual, tufted, 10–15 cm long, slender herbs, basally geniculate. Leaves 2–15×0.2–0.7 cm, narrowly linear-lanceolate, hairy. Panicles 2.5–15 cm long, spike-like, cylindric, silky-hairy, yellowish-green, sometimes lobulate. Spikelets 0.2–0.3 cm long, ovate-oblong, ciliate, awned.

North Gujarat and Broach (river bed).

FLS & FRS : Oct.–Apr.

PSEUDANTHISTIRIA (Hack.) Hk. f.

Key to species

1. Lower glume of sessile spikelet shortly hispid; margins of the spathes setose, with stiff hairs from minute tubercles.. .. .. .

1. **Lower glume of sessile spikelet glabrous;** margins of the spathes and often the dorsal surface in the lower half covered with setae from large, often dark-coloured tubercles..*P hispida*

Pseudanthistiria heteroclita (Roxb.) Hk. f. in Hk. f. FBI 7:219. 1896; Blatter & McCann 121. t. 76; Bor 203; Patel 91:318; S 318. *Anthistiria heteroclita* Roxb. Fl. Ind. 1:253. 1820.

75–150 cm tall, densely tufted, basally geniculate herbs. Leaves 6–20 cm long, linear, glabrous or hairy. Panicles 10–25 cm long, leafy, of many, shortly pedunculate fascicles of spatheate spikes. Bisexual spikelets sessile, male-spikelets 2, pedicelled.

Saurashtra and north to south Gujarat in exposed dry areas. (ZINKU-FUL-GHAS; NANI BHATADI)

FLS & FRS : Aug.–Dec.

Pseudanthistiria hispida Hk. f. in Hk. f. FBI 7:219. 1896; C 3:512; Blatter & McCann 120; Bor 206; Patel 91:318; Ch & O 246; S 318.

45–60 cm tall, rather stout, erect, glabrous and polished, tufted annuals. Leaves 5–12.5×0.3–0.6 cm, linear, finely acuminate, hairy, hairs bulbous-based. Panicle 6–10 cm long, simple with slender, often paired branches. Ultimate fascicles of spikelets 1.5–2 cm broad, hirsute, bulbous based. Sessile spikelet, 0.4 cm long, ovate-oblong, pedicellate spikelet lanceolate.

Gujarat, in forests, under shade (Patel, 1965). At Dangs, abundant, gregarious in open grasslands. (BABARIU, NANI-BHATDI).

FLS & FRS : Aug.–Nov.

PSEUDORAPHIS Griff.

Pseudoraphis spinescens (R. Br.) Vickery in Proc. Roy. Soc, Queensl. 62 (no. 7) : 69.1952; Bor 353; S 319. *Panicum spinescens* R. B. Prodr. 193. 1810. *Chamaeraphis spinescens* (R. Br.) Poir. in Lam. Encycl. Meth. Bot. 2:189. 1811; FBI 7:62; C 3:437. *Panicum asperum* Koen. in Naturf. 23:209. 1788 (non Lam. 1778). *Pseudoraphis asper* (Koen.) Pilger in Notizbl. Bot. Gart. Berl. 10:210. 1928; Blatter & McCann 168. t. 109.

Annual, marshy herbs, rooting at lower nodes in mud or floating in water. Leaves 4–8.5 cm long, flat or involute, linear-lanceolate. Panicles 3.5–10 cm long. Spikelets 0.5–0.7 cm long, lanceolate, dorsally compressed.

North to south Gujarat, along margins of ponds and ditches; locally abundant.

FLS & FRS : Aug.–Oct.

PSEUDOSORGHUM A. Camus

Pseudosorghum fasciculare (Roxb.) A. Camus in Bull. Mus. Hist. Nat. Paris 26:662. 1920; Bor 205; S 319. *Andropogon fascicularis* Roxb. Fl. Ind. 1:269. 1820. *Andropogon nitidulus* Hk. f. in Hk. f. FBI 7:199. 1896.

60–75 cm tall, erect, simple or branched, slender herbs, glabrous but for villous nodes. Leaves 2.7–20×0.2–0.8 cm, linear, sparsely tubercle-based hairy. Panicles simple to compound, villous, with fascicled, 4.5–5 cm long, branches. Sessile spikelets bisexual, 0.4–0.6 cm long, glabrous dorsally; pedicellate spikelets male.

Dangs-Waghai (*RR* 2201, 2236; deposited in Blatter Herbarium).

FLS & FRS : Nov.

ROTTBOELLIA L.f.

Rottboellia exaltata L.f. Nov. Gram. Gen. 40. t. 1. 1779 & Suppl. Pl. 114. 1781; FBI 7:156; C 3:473; Blatter & McCann. 38. t. 27; Patel 91: 318 ; S & J 57.

Perennials, leafy, erect, glabrous, branching from base. Leaves 10–30 × 2–3 cm, linear-lanceolate, hispidly hairy above, spinulosely scabrid on margins. Racemes 8–15 cm long, terete, glabrous, upper part with imperfect spikelets. Sessile spikelet 0.4–0.6 cm long. Pedicellate spikelet imperfect.

Saurashtra (Sasan, *HS* 16532).

FLS & FRS : Oct.

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SACCHARUM L.

1. Peduncle hairy below the panicle.. .. ..*S. spontaneum*
1. Peduncle not hairy:
   2. Lower glume of sessile spikelet glabrous.. *S. officinarum*
   2. Lower glume of sessile spikelet with long hairs.. .. ..*S. bengalense*

Saccharum bengalense Retz. Obs. Bot. 5:16. 1789; Bor 211; Patel 91:318; S & J 57. *Saccharum arundinaceum* Hk.f. in Hk.f. FBI 7:119. 1896 (p. p. non Retz.); C 3:465. *Saccharum munja* Roxb. Fl. Ind. 1:250. 1832; Blatter & McCann 48. t. 32.

Tall grass, up to 5.5 m high, with solid culms. Leaves proportionately very long, linear, flat. Flowering panicles 30–90 cm long, lanceolate, pale-cream-coloured to dark-reddish-purple. Spikelets paired, one sessile, other pedicellate, awnless, lanceolate, up to 0.5 cm long.

Throughout in dry sandy soil. (SARKHANT, HADOL, MUNJ).

FLS & FRS : Oct.-Dec.

Saccharum officinarum L. Sp. Pl. 54. 1753; FBI 7:118; C 3:466; Blatter & McCann 46; Bor 212; Patel 91:318; S & J 57.

Perennials, erect, 1–3.5 m tall, stout. Leaves rigid, linear-lanceolate, sharply serrate on margins. Panicles pyramidal, very long, dense, silvery; primary branches verticillate or subverticillate, very slender, glabrous or hairy. Spikelets 0.4–0.5 cm long, lanceolate, surrounded by densely silky-white hairs, paired, one sessile, other pedicellate.

Cultivated at some places (SHERDI, GANNA)

FLS & FRS : Sep.-Dec.

Saccharum spontaneum L. Mant. Alt. 183. 1771; FBI 7:118; C 3: 465; Blatter & McCann 45, t. 31; Bor 214; Patel 91:318; Ch & O 239; S & J 57.

Thickly rhizomatous, perennial, stout herbs, 1.5–2 m tall. Leaves 20–65 cm long, linear, stiff, glabrous, scabrulous on margins. Panicles 20–50 cm long, lanceolate, branches 10–15 cm long; rachis silvery-silky-pilose. Spikelets 0.2–0.35 cm long, lanceolate, awnless, paired one pedicelled, other sessile.

Throughout, common. (DABH, KANS, KATHHAL, KATUSLA).

FLS & FRS : Aug.-Jan.

SACCIOLEPIS Nash

Sacciolepis interrupta (Willd.) Stapf in Prain, Fl. Trop. Afr. 9:757. 1920; Blatter & McCann 167. t. 108; Bor 358; Patel 91: 327. *Panicum interruptum* Willd. Sp. Pl. 1:341. 1798; FBI 7:40; C 3:450.

Perennial herbs, glabrous, 45–75 cm long, ascending from stout, creeping and rooting or floating root-stocks. Leaves 7–30 × 0.5–1.2 cm, linear, flat, glabrous, smooth or scabrulous on margins. Panicle spike-like, 6–40 cm long. Spikelets 0.4–0.5 cm long, ovoid-lanceolate, glabrous, green, subsessile, crowded in small fascicles.

Frequent in marshy places along margins of ponds and ditches (Patel, 1965).

FLS & FRS : Oct.-Mar.

SCHOENEFELDIA Kunth

Schoenefeldia gracilis Kunth, Rev. Gram. 1:283. t. 53. 1830; Bor 474; Patel 91:331; S & J 57. *Schoenefeldia pallida* Edgew. in Journ. As. Soc. Beng. 21:183. 1852. *Chloris pallida* (Edgew.) Hk. f. in Hk. f. FBI 7:239. 1896; Blatter & McCann 252. t. 67.

A slender, tufted, simple or branched, almost filiform, 20–50 cm tall annual. Leaves 10–20 cm long, very narrowly linear, flaccid, glabrascent. Spikes 1–3, erect, digitate, golden-yellow, 7–13 cm long, closely pectinate with two rows of erecto-patent, long awned spikelets. Spikelets narrow, 0.15–0.2 cm long, subsessile.

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Saurashtra, north Gujarat and central Gujarat in dry sandy areas.

FLS & FRS : Sep.–Feb.

SEHIMA Forsk.

Key to species

1. Lower glume of sessile spikelets rounded on the back with a deep longitudinal slit like groove.. .. ..*S. sulcatum*
1. Lower glume without a slit but deeply grooved :
   2. Sessile spikelet 0.8–0.9 cm long; awn minutely ciliate along the spiral; perennial.. .. ..*S. nervosum*
   2. Sessile spikelet 0.9–1.4 cm long; awn distinctly ciliate along the spiral; annuals.. .. .. ..*S. ischaemoides*

Sehima ischaemoides Forsk. Fl. Aegpt.–Arab. 178. 1775; Bor 218; Blatter & McCann 22; S & J 57. *Andropogon sehima* Steud. Syn. Pl. Glum. 1:369. 1854. *Ischaemum laxum* R. Br. Prodr. 205. 1810; FBI 7:136; C 3:482 (p. p.).

Slender annuals, 30–40 cm tall, tufted. Leaves 8–12.5 × 0.2–0.4 cm, glaucous, linear, more or less scabrid. Racemes solitary or 2-3, 2.5–7.5 cm long. Sessile spikelets linear.

Saurashtra.

FLS & FRS : Sep.–Oct.

Sehima nervosum (Rottl.) Stapf in Prain Fl. Trop. Afr. 9:36. 1917; Bor 218; Blatter & McCann 21. t. 14; Patel 91:319; Ch & O 241; S & J 57; S 319. *Andropogon nervosum* Rottl. apud Willd. in Verh. Ges. Naturf. Fr. Berl. Neue Schr. 4:218. 1806. *Ischaemum laxum* R. Br. Prodr. 205. 1810; FBI 7:136; C 3:482 (p. p.).

Densely tufted, 60-75 cm tall, slender, simple or nearly so, erect, glabrous perennials. Leaves 20–30 × 0.4–0.5 cm, linear, rigid, more or less scabrid. Raceme solitary, 7.5–11.5 cm long, erect, hairy. Sessile spikelets linear to linear-lanceolate; pedicellate spikelet 1–1.2 cm long, lanceolate.

Throughout (except Kutch) in dry places and on old walls.

FLS & FRS : Aug.–Oct.

Sehima sulcatum (Hack.) A. Camus, Bull. Mus. Hist. Nat. Paris 27:373. 1921; Blatter & McCann 23. t. 15; Bor 219; Patel 91:319. S & J 57. *Ischaemum sulcatum* Hack. in DC. Mon. Phan. 6:248. 1889; FBI 7:137; C 3:483.

Geniculately ascending, 30–50 cm long, weak, glabrous herbs. Leaves 10–20 × 0.3–0.4 cm, linear or lanceolate, setaceously acuminate. Raceme solitary, 5–7 cm long. Sessile spikelet 0.9–1 cm long, awned lanceolate, scabro–punctate; pedicelled one smaller than sessile, awnless.

Saurashtra and Gujarat (Patel, 1965).

FLS & FRS : Aug.–Oct.

SETARIA P. Beauv. non. cons.

Key to species

1. Bristles retrosely barbed.. .. .. ..*S. verticillata*
1. Bristles antrorsely barbed :
   2. Upper glume as long as upper lemma; lemma quite smooth or minutely rugulose.. .. .. ..*S. italica*
   2. Upper glume shorter than upper lemma; lemma distinctly rugose :
      3. Inflorescence a cylindric false spike :
         4. Spikelets 0.3 cm long; upper lemma coarsely rugose, boat–shaped and slightly keeled upwards, broad and dorsally strongly curved in profile.. ..*S. glauca*
         4. Spikelets 0.22–0.25 cm long; upper lemma usually finely rugose, narrow and dorsally gently curved, not keeled at all.. .. .. ..*S. pallide–fusca*
      3. Inflorescence a narrow panicle, sometimes loosely lobed, especially in lower part, tapering upwards.... .. ..*S. tomentosa*

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Setaria glauca (L.) P. Beauv. Agrost. 51. 1812; FBI 7:78 (p. p.); C 3:435; Blatter & McCann 172; Bor 360; Patel 91:327; Ch & O 251; S & J 57; S 319. *Panicum glaucum* L. Sp. Pl. 56. 1753.

15–45 cm tall, slender, loosely tufted herbs. Leaves 5–12 × 0.4–1 cm, flat, linear, glabrous or softly hairy. Spike-like racemes, densely flowered, 1–7 cm long, erect, linear-cylindric, fulvous or rufous. Spikelets numerous, ellipsoid, glabrous.

Throughout, everywhere; common.

FLS & FRS : July–Nov.

Setaria italica (L.) P. Beauv. Ess. Agrost. 51 & 170 & 178. 1812; C 3:437; Blatter & McCann 175; Bor 362; Patel 91:327. *Panicum italicum* L. Sp. Pl. 56. 1753.

75–100 cm tall, slender, tufted herbs. Leaves 20–30 × 1–2 cm, linear to linear-lanceolate, flat, glabrous. scabrulous on margins. Panicles 13–23 × 1.7–2 cm, cylindric, often lobed near base. Spikelets 0.2–0.5 cm long, ovoid or ovoid-oblong, pale- to drak-brown.

Cultivated at some places; also an escape. (CHANO, KANG, PARDESHI BAJRI)

FLS & FRS : Aug.–Oct.

Setaria pallide-fusca (Schum.) Stapf & Hubb. in Kew Bull. 1930; 259. 1930; Bor 363; Patel 91:327; S & J 57. *Panicum pallide-fuscum* Schum. Beskr. Guin. Pl. 58. 1827.

25–50 cm tall, tufted, slender herbs. Leaves 5-8.5 × 0.3–0.7 cm, linear, flat, glabrous or sparsely hairy. Panicles 5-12 cm long, linear-cylindric; bristles mostly rufous, rarely purplish.

Throughout (except Kutch); occasional.

FLS & FRS : July-Sep.

Setaria tomentosa (Roxb.) Kunth, Rev. Gram. 1:47. 1829; Bor 365; Patel 91:327; Ch & O 251; S & J 57; S 319. *Panicum tomentosum* Roxb. Fl. Ind. 1:303. 1820. *Panicum intermedium* Roth,

Nov. Pl. Sp. 47. 1821 (non Vahl ex Hornem. 1813). *Setaria intermedia* (Roth) R. & S. Syst. Veg. 2:489. 1817; FBI 7:79; C 3:436; Blatter & McCann 174.

Slender, erect or ascending, glabrous, tufted, 60–90 cm tall herbs. Leaves 5–20 × 0.4–0.6 cm, linear-lanceolate, flat, glabrous or sparsely softly hairy, scabrulous on margins. Panicles 5.4–15 cm long, erect, dense-flowered, narrowly pyramidal. Spikelets ± 0.2–0.25 cm long, ovoid, subacute.

Throughout, in hedges and forest undergrowth; common. (CHIKTU, CHIKANIU, KUTRI)

FLS & FRS : July–Dec.

Setaria verticillata (L.) P. Beauv. Ess. Agrost. 51 & 178. 1812; FBI 7:80; C 3:436; Blatter & McCann 174; Bor 365; Patel 91:327; Ch & O 250; S & J 57. *Panicum verticillatum* L. Sp. Pl. (ed. 2) 82. 1762.

Very similar to *S. tomentosa* in habit, habitat and general appearance but differs from it in having retrorsely barbed bristles.

Throughout; common, in hedges and shaded ground, (CHIPATIU–MOTU)

FLS & FRS : July–Oct.

SORGHUM Moench. nom. cons.

Key to species

1. Species wild :
   2. Sheath nodes glabrous or finely pubescent, not bearded :
      3. Sessile spikelets more or less obtuse, elliptic to subelliptic or elliptic-lanceolate, 0.4–0.55 cm long; lower glume with keels ending in distinct minute teeth, forming with the subhyaline apex, a more or less distinct, 3-toothed tip :
         4. Leaf blades 0.5–2 cm broad (rarely more); culms up to 0.5 cm in diameter; panicles often somewhat contracted after flowering, upto 25 cm long, up to 5 cm wide with lower branches 5–8 cm long.. .. .. *S. halepense*

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4. Leaf blades 2–4 cm wide when mature; culms upto 1 cm in diameter; panicles large, loose and spreading, 25–55 cm long and 10-25 cm wide, with lower branches 10–25 cm long.. ..*S. miliaceum*

3. Sessile spikelets acute to acuminate 0.5–0.62 cm long; lower glume with the keels ending without or with only obscure teeth.. .. .. ..*S. controversum*

2. Sheath nodes densely bearded :

5. Sessile spikelet 0.4–0.6 × 0.1–0.15 cm.. ..*S. nitidum*

5. Sessile spikelet 0.8–1 × 0.2–0.3 cm..*S purpureo-sericeum*

1. Species cultivated.. .. ..*S. bicolor*

Sorghum bicolor (L.) Moench. Meth. Pl. Hort. Bot. Merburg. 207. 1794; Bor 207. *Holcus sorghum* L. Sp. Pl. 1047. 1753. *Holcus bicolor* L. Mant. Alt. 301. 1771. *Andropogon sorghum* (L.) Brot. Fl. Lusit. 1:88. 1804; FBI 7:183; C 3:511. *Sorghum vulgare* Pers. Syn. Pl. 1:107. 1805; Blatter & McCann 58; Patel 91:319.

A stout annual, 75–200 cm tall. Leaves 15-25 × 1–2 cm, broadly lanceolate, flat, glabrous. Panicles 10–25 cm long, densely thyrsiform, decompound, with verticillate branches. Spikelets 0.3–0.5 cm long, broadly ovate-lanceolate, hairy.

Cultivated as a cereal crop at some places, extensively in many parts of south Gujarat. (JOWAR, JUWAR, JUWARI, JAR).

FLS & FRS : Dec.–Mar.

Sorghum controversum (Steud.) Snowden in Journ. Linn. Soc. (Bot.) 55: 210. 1955; Bor 222. *Andropogon laxus* Roxb. Fl. Ind. 1:275. 1820 (non Willd. 1806). *Andropogon controversus* Steud. Syn. Pl. Glum. 1:391. 1854.

Stout, 2-4 m tall herbs, with glabrous culms. Leaves 15-30 × 2–3.5 cm, linear, flat. Panicles 20–40 cm long, terminal, spreading. Spikelets 0.5–0.6 cm long.

Dangs–Ahwa; a very rare species (*BS* 2488; specimen deposited at FRI Herbarium, Dehardun).

FLS & FRS : Jan.

Sorghum halepense (L.) Pers. Syn. Pl. 1:101. 1805; Blatter & McCann 55. t. 37; Bor 222; Patel 91:319; Ch & O 243; S & J 57; S. 320. *Holcus halepensis* L. Sp. Pl. 1047. 1753. *Andropogon halepensis* (L.) Brot. Fl. Lus.1:89. 1804; FBI 7:182; C 3:502.

1.5–2.5 m tall, perennial herbs, with simple or branched, solid culms. Leaves 12–30 × 1–2 cm, linear to linear—lanceolate, flat, glabrous. Panicles 10–45 cm long, oblong-pyramidal. Spikelets 0.5–0.6 cm long, lanceolate, pale-brown or straw–coloured.

Throughout, in hedges and forest undergrowth; common. (BARU, BARUA)

FLS & FRS : July–Jan.

Sorghum miliaceum (Roxb.) Snowden in Journ. Linn. Soc. (Bot.) 55:207. 1955; Bor 223. *Andropogon miliaceus* Roxb. Fl. Ind. 1:276. 1820.

Similar to *S. halepense* (L.) Pers. For differences between the two see the key.

Rajpipla–Sagbara (*VKS* 310, 2607).

FLS & FRS : Sep.–Oct.

Sorghum nitidum (Vahl) Pers. Syn. 1:101. 1805; Blatter & McCann 58; Bor 246; Patel 91:319; *Andropogon serratus* Thunb. Fl. Jap. 41. 1784. *Holcus nitidus* Vahl, Symb. Bot. 2:102. 1791. *Sorghum serratum* (Thunb.) O. Ktze. Rev. Gen. Pl. 2:792. 1891 (non R. & S. 1817).

Tufted annuals, 1–2 m tall, with villous nodes. Leaves 10–75 × 0.8–2 cm, linear, glabrous or sparsely hairy, hairs from tubercled base. Panicles 10-30 cm long, oblong, lax, subsimple, with glabrous or scabrous, whorled branches, whorls distant. Spikes 1–4 cm long. Sessile spikelets broadly ellipsoid, pedicellate ones linear-oblong.

South Gujarat in open dry areas (Patel, 1965).

FLS & FRS : Aug.–Oct.

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Sorghum purpureo-sericeum (Hochst. ex A. Rich.) Aschers. & Schweinf. in Schweinf. Beitr. Fl. Aethiop. 310. 1869; Blatter & McCann 57. t 38; Bor 246; S & J 57. *Andropogon purpureo-sericeus* Hochst. ex A. Rich. Tent. Fl. Abyss. 2:469. 1851; FBI 7:185; C 3:503. *Sorghum deccanense* Sensu Patel in Ind. For. 91:319. 1965.

Annuals, 90-120 cm tall, erect, stout or slender, glabrous but for villous nodes, polished. Leaves 20–25×0 6–0.8 cm, linear, sparingly appressed-hairy, scabrous on margins. Panicles 10–20 cm long, erect, with 1.3–2.5 cm long, filiform branches. Racemes 2.5–4 cm long. Sessile spikelet 0.5–0.6 cm long, densely villous with red to white hairs. Pedicellate spikelets equalling sessile spikelet, linear-lanceolate.

South Gujarat on black soil. Blatter & McCann (1935) cite loc. Garhvi-Dangs; also from Saurashtra (*Albertson* 18033).

FLS & FRS : Sep.–Nov.

SPINIFEX L.

Spinifex littoreus (Burm. f.) Merr. in Philip. Journ. Sci. Bot. 7:229. 1912; Bor 366; Patel 91:328; S & J 57. *Stipa littorea* Burm. f. Fl. Ind. 29. 1768. *Stipa spinifex* L. Mant. 1:34. 1767. *Spinifex squarrosus* L. Mant. 2:300. 1771; FBI 7:63; C 3:428; Blatter & McCann 122. t. 76A.

Perennial, creeping, dioecious shrubs. Leaves 6–15 cm long, rigid, bluish-green, thickly coriaceous, spinous-tipped. Inflorescence a large, terminal, stiff, globose, bracteate head. Pistillate spikelets solitary, densely arranged in compact, spatheate umbels; staminate spikelets in rigid, radiating spatheate racemes.

Along sea coast, on sands; common.

FLS & FRS : Oct.–Feb.

SPODIOPOGON Trin.

Spodiopogon rhizophorus (Steud.) Pilger in Engler & Prantl, Naturl. Pfam. Aufl. (ed. II) 14e : 119. 1940; Bor 246; Patel 91:319; Ch & O 240; S & J 57; S 320. *Andropogon albidus* Wall. Cat. no. 8821. 1829 (nomen). *Andropogon rhizophorus* Steud. Syn.

Pl. Glum. 1:381. 1854. *Spodiopogon albidus* Bth. in Journ. Linn Soc. (Bot.) 19:66. 1881; FBI 7:108; C 3:464; Blatter & McCann 51. t. 34.

30–45 cm tall, tufted, slender herbs. Leaves 3–12 × 0.3–2.5 cm, linear to linear-lanceolate, membranous, glabrous or sparsely hairy. Panicles 3.5–5 cm long. Spikelets 0.5–0.6 cm long, lanceolate, at length straw-white.

Throughout (except Kutch), gregarious, in stony ground in forests.

FLS & FRS : Aug.–Jan.

SPOROBOLUS R. Br.

Key to species

1. Lower glume much shorter than the lemma, rarely two-thirds as long :
2. Upper glume distinctly shorter than the lemma, lowest branches not truly whorled :
   3. Panicles effuse, at least at maturity; stamens 2 .. .. *S. diander*
   3. Panicles contracted, subspiciform, often interrupted, upto 2.5 cm wide; stamens 3 .. .. .. *S. fertilis*
2. Upper glume nearly as or longer than lemma; lowest branches whorled or not :
   4. Panicle contracted; lower branches not truly whorled :
      5. Spikelets less than 0.2 cm long; leaf margins smooth .. .. *S. tremulus*
      5. Spikelets 0.2 cm long; lower glume about 0.5 cm long, rounded at tip; leaf margins spinulose .. .. *S. maderaspatenus*
   4. Panicles effuse, spreading, at least at maturity; lower branches truly whorled :
      6. Annuals, estoloniferous; spikelets minute upto 0.13 cm long .. .. *S. coromandelianus*

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6. Perennials; plants with stout, prostrate, woody stolons; spikelets 0.2–0.25 cm long .. *S. marginatus*

1. Lower glume as long as the spikelet or at least three quarters its length :

8. Spikelets 0.2–0.25 cm long, pale; basal leaves not glaucous but pungent; anthers 1–1.5 mm long; ligule of long hairs .. .. *S. virginicus*

8. Spikelets 0.1–0.15 cm long, glaucous; basal leaves glaucous but not pungent; anthers 0.75–0.8 mm long; ligule almost absent.. .. .. *S. helvolus*

Sporobolus coromandelianus (Retz.) Kunth, Rev. Gram. 1:68. 1829; FBI 7:252; C 3:542; Blatter & McCann 228. t. 153; Bor 627; Patel 91:337; Ch & O 263; S & J 58. *Agrostis coromandeliana* Retz. Obs. Bot. 4:19. 1786.

Annual, tufted, slender, 24–30 cm tall herbs. Leaves 2–5 cm long, linear, glabrous. Panicles 10–15 cm long, narrowly pyramidal, branches slender, 1–3.5 cm long, densely crowded. Spikelets 0.2–0.25 cm long, lanceolate.

Throughout, in shaded spots; common.

FLS & FRS : July–Jan.

Sporobolus diander (Retz.) P. Beauv. Ess. Agrost. 26, 147 & 178. 1812; FBI 7:247; C 3:539; Blatter & McCann 221. t. 148; Bor 629; Patel 91:337; Ch &O 263; S & J 58; S 320. *Agrostis diandra* Retz. Obs. Bot. 5:19. 1789.

Annuals or perennials, 30–45 cm tall. Leaves 7–15 cm long, narrowly linear, convolute. Panicles 10–15 cm long, narrowly, pyramidal; branches 2–4.5 cm long, densely crowded, almost capillary. Spikelets 0.2–0.4 cm long, ovate, shortly pedicellate.

Throughout (except Kutch); common.

FLS & FRS : Aug.–Dec.

Sporobolus fertilis (Steud.) Clayton in Kew Bull. 19:291. 1965; S & J 58. *Agrostis fertilis* Steud. Syn. Pl. Glum. 170. 1854. *Sporobolus indicus* auct; non (L.) R. Br.; FBI 7:247; C 3:539; Blatter & McCann 222; Bor 630; Patel 91:337.

Perennial, densely tufted, stout, glabrous herbs, 45–60 cm tall, Leaves mostly crowded near base, as long as or shorter than stem, wiry, convolute or rarely flat. Panicle 30–45 × 1.3–2 cm, often interrupted. Spikelets 0.2–0.25 cm long, very shortly pedicellate.

Kutch, Saurashtra, and Dangs. (VELARI-MARMAR, KHARIGA).

FLS & FRS : Aug.–Oct.

Sporobolus helvolus (Trin.) Th. Dur. et Schinz, Consp. Fl. Afr. 5:820. 1895; Bor 629; Patel 91:337; S & J 58. *Vilfa helvola* Trin. in Mem. Acad. Sci. Petersb. (Ser. 6.) 5:2 & 52. 1839. *Sporobolus glaucifolius* Hochst. ex Steud. Syn. Pl. Glum. 154. 1854; FBI 7:250; C 3:540; Blatter & McCann 224. t. 150.

Perennial, 30–45 cm tall, densely tufted herbs. Leaves 4–12.5 × 0.2–0.4 cm, flat, or undulate. Panicle 7.5–12.5 cm long, contracted, interrupted, pale-yellowish-white. Spikelets crowded, ±0.2 cm long, very shortly pedicellate.

Throughout in sandy and saline areas.

FLS & FRS : Aug.–Oct.

Sporobolus maderaspatenns Bor in Kew. Bull. 1957: 234. 1957 & Grasses of Burma, Ceylon, India & Pakistan 632. 1960; Patel 91:337; S & J 58. *Sporobolus orientalis* (Nees) Kunth, sensu Hk. f. in Hk. f. FBI 7:251. 1896 (nom. illegit.); C 3:541.

Stoloniferous, 15–45 cm tall herbs. Leaves 2.5–20 × 0.2–0.4 cm, scabrous or subserrulate on margins. Panicles narrow oblong, branches 1.2–2 cm long, suberect. Spikelets 0.2–0.25 cm long.

Throughout in sandy or saline areas; common.

FLS & FRS : Oct.–Dec.

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Sporobolus marginatus Hochst. ex A. Rich. Tent. Fl. Abyss. 2:397. 1851; Bor 632; Patel 91:338; Ch & O 263; S & J 58. *Sporobolus arabicus* Boiss. Diag. Pl. (Ser. I) 13:47. 1853; FBI 7:252; C 3:541. *Sporobolus pallidus* Boiss. Fl. Orient. 5:512. 1854; Blatter & McCann 227. t. 152.

Perennial, tufted, erect or basally geniculate herbs, 15–45 cm tall. Leaves 2–10 cm long, flat, or convolute, linear, scabrulous on margins. Panicles 7–15 cm long, effuse; branches whorled; capillary, 3–4 cm long, with spicately arranged spikelets. Spikelets 0.2–0.25 cm long.

Throughout Gujarat; not common.

FLS & FRS : Aug.–Dec.

Sporobolus tremulus (Willd.) Kunth, Rev. Gram. 1:67. 1829; FBI 7:250; Blatter & McCann 225; Bor 633; Patel 91:338; S & J 58. *Agrostis tremula* Willd. Sp. Pl. 1:372. 1798.

Annuals, 10–25 cm tall, erect or prostrate, often tufted, from stout, decumbent, 15–45 cm long base. Leaves 0.8–5 cm long, narrowly linear, subulate or filiform, flat. Panicles narrow, 4–6 cm long, subspiciform, contracted, flexuous and interrupted, with often erect, rarely a few spreading branches. Spikelets 0.3–0.5 cm long.

Throughout; rare to occasional in areas of occurrence.

FLS & FRS : July–Dec.

Sporobolus virginicus (L.) Kunth, Rev. Gram. 1:67. 1829; FBI 7:249; Blatter & McCann 225. t. 149; Bor 634; Patel 91:338; S & J 58. *Agrostis virginica* L. Sp. Pl. 63. 1753.

Perennials, erect or basally geniculate from decumbent, woody, creeping base. Leaves 2.5–7 cm long, close-set, distichous erecto-patent, narrow and almost terete due to involute margins. Panicles 2.5–10 cm long, elongate, subspiciform, interrupted. Spikelets 0.2–0.25 cm long.

Common along sea shores.

FLS & FRS : Oct.–Dec.

TETRAPOGON Desf.

Key to species

1. Lemmas covered with long fine hairs.. .. ..*T. villosus*
1. Lemmas glabrous.. .. ..*T. tenellus*

Tetrapogon tenellus (Roxb.) Chiov. in Ann. Ist. Bot. Roma 8:352. 1908; Bor 475; Patel 91:332; Ch & O 260; S & J 58. *Chloris tenella* Roxb. Fl. Ind. 1:330. 1820; FBI 7:290; C 3:555; Blatter & McCann 254. t. 169.

Annual, erect, slender herbs, 15–40 cm tall. Leaves 6–14 × 0.2–0.4 cm, linear-lanceolate. Spike solitary, 2–4 cm long, erect. Spikelets 0.4–0.6 cm long, cuneate, bifarious, 3-awned.

Saurashtra, north Gujarat, Panchmahals, Pavagadh, Broach; occasional.

FLS & FRS : Aug.–Dec.

Tetrapogon villosus Desf. Fl Atlant. 2:389. t. 255. 1799; Bor 475; Patel 91:332; S & J 58. *Chloris villosa* Pers. Syn. Pl. 1:87. 1805; FBI 7:291; C 3:556; Blatter & McCann 254.

15–30 cm tall, tufted, geniculate annuals. Leaves 4.5–7× 0.2–0.5 cm, ovate-lanceolate, flat, sparsely hairy. Spikes 2–3.5 cm long, solitary. Spikelets 0.45–0.5 cm long, cuneate, bifarious, 3-awned.

Throughout (except Kutch) not common.

FLS & FRS : Oct.–Nov.

THELEPOGON Roth ex R. & S.

Thelepogon elegans Roth ex R. & S. Syst. Veg. 2:788. 1817; FBI 7:148; C 3:490; Blatter & McCann 27. t. 18; Bor 247; Patel 91:329; Ch & O 242.

Robust, 30–90 cm tall, tufted, erect or basally geniculate, glabrous herbs. Leaves 10–25 × 1–2 cm long, linear, bulbous hairy. Racemes 2.5–5 cm long, corymbose. Spikelets 0.5–0.6 cm long, yellowish-white, ovate, beaked, with a small, annular callus.

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Gujarat in open areas and near cultivation (Patel, 1965).
FLS & FRS : Aug.-Oct.

THEMEDA Forsk.

Key to species

1. Pairs of involucral spikelets inserted at different levels :
   2. Involucral spikelets entirely glabrous or puberulous but without tubercle-based hairs.. .. .. ..*T. cymbaria*
   2. Involucral spikelets covered on the lower glume with numerous or sparse tubercle-based bristles :
      3. Racemes less than 1.5 cm long.. .. ..*T. triandra*
      3. Racemes more than 1.5 cm long... .. ..*T. tremula*
1. Pairs of involucral spikelts inserted at the same level :
   4. Involucral spikelets over 0.6 cm long, awns upto 6 cm long; panicle of congested heads loosely arranged..*T. laxa*
   4. Involucral spikelets less than 0.6 cm long; awn shorter; lower glumes sparsely to densely strigose..*T. quadrivalvis*

Themeda cymbaria (Roxb.) Hack. DC. Mon. Phan. 6:668. 1889; C 3:514; Blatter & McCann 118; Bor 251; Patel 91:320. S & J 58. *Anthistiria cymbaria* Roxb. Hort. Beng. 6. 1814 (nomen) & Fl. Ind. 1:255. 1820; FBI 7:215.

Perennials, 0.9–2 m tall, erect, branched, smooth. Leaves 5–10×0.4–0.8 cm, linear, finely pointed, glaucous beneath. Panicles 30–60 cm long, supra-decompound, branches bearing shortly pedunculate, oblong fascicles 1.3–2 cm long, of nearly glabrous racemes. Involucral spikelets 0.4–0.6 cm long, contiguous in superimposed pairs, glabrous. Bisexual spikelet solitary, subsessile, male pedicellate.

Throughout, common, in open areas.
FLS & FRS : Aug.-Oct.

Themeda laxa (Anderss.) A. Camus in Bull. Mus. Hist. Nat. Paris 26:423. 1920; Bor 251. *Anthistiria laxa* Anderss. in Nov. Act. Sci. Upsal. (Ser. 3.) 2:243. 1856; FBI 7:213.

60–90 cm tall, erect herbs, tufted. Leaves 15–39×0.6–1.2 cm, linear to linear-lanceolate. Panicles leafy, of few small heads, in verticillate clusters on filiform branches. Fascicles of racemes 1–1.5 cm in diameter. Involucral spikelets 0.6–0.8 cm long, often reddish, with glabrous skin. Bisexual spikelet 0.4–0.5 cm long, including bearded callus; pedicellate ones 0.6–0.7 cm long.

Rajpipla (*Patel* 2242).
FLS & FRS : Oct.

Themeda quadrivalvis (L.) O. Ktze. Rev. Gen. Pl. 2:794. 1891; Blatter & McCann 118; Bor 252; Patel 91:320; Ch & O 249; S & J 58; S 302. *Andropogon quadrivalvis* L. in Murr. Syst. Veg. (ed. 13) 758. 1774. *Anthistiria ciliata* L. f. Suppl. 113. 1781; FBI 7:213. *Themeda ciliata* (L. f) Hack. in DC. Mon. Phan 6:664. 1889; C 3:514.

60–90 cm tall, simple or sparingly branched, erect or basally geniculate herbs. Leaves 15–25 cm long, linear, flat, glabrous. Panicles 30–45 cm long, dense; racemes 0.8–1.5 cm long, erect; in obconical or broadly ovate fascicles from 2.5–5.5 cm long, glabrous or hairy, spathiform bracts. Involucral spikelets whorled, sessile, persistent, 0.4–0.6 cm long. Bisexual spikelet solitary, 0.4–0.5 cm long, narrow, linear-lanceolate, pedicellate ones narrow, glabrous.

Throughout; common, gregarious.
FLS & FRS : Aug.-Dec.

Themeda tremula (Nees ex Steud.) Hack. in DC. Mon. Phan. 6:667. 1889; C 3:515; Blatter & McCann 119. t. 75; Bor 254; *Anthistiria tremula* Nees ex Steud. Syn. Pl. Glum. 1:401. 1855; FBI 7:214.

Erect or ascending from creeping root-stock, perennials, 60–75 cm tall. Leaves 10–30×0.4–1 cm, linear, scabrid on margins. Panicle 30–60 cm tall, fascicles of racemes rather distant, 1.5–3 cm across, subflabelliform or subglobose. Involucral

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spikelets in contiguous, superposed pairs, 0·6-0.8 cm long. Bisexual spikelets 2, sessile, 0.3–0.5 cm long. Pedicellate ones like involucral spikelets.

Dangs (*BS* 311, 384, 2264; specimens at FRI herbarium, Dehradun).

FLS & FRS : Aug.–Oct.

Themeda triandra Forsk. Fl. Aeg.-Arab. 178. 1775; Blatter & McCann 115. t. 74; Bor 254. f. 27; Patel 91:320; Ch & O 248; S & J 58; S 252. *Anthistiria imberbis* Retz. Obs. 3:11. 1783; FBI 7:211. *Anthistiria ciliata* Grah. ex Dalz. & Gibs. Bombay Fl. 304. 1861 non L. f. 1781. *Themeda imberbis* Cooke, Fl. Pres. Bombay 2:993.1908 & 3:513. 1958 (reprinted).

30-60 cm tall, perennial herbs, erect or geniculately ascending. Leaves 15-39 cm long, linear, flat, scabrid above and on margins. Panicles 5–13 cm long; racemes clustered, 1.5–2.8 cm wide; involucral spikelets male, 0.5–1 cm long, sessile. Bisexual spikelet solitary, 0.5–0.7 cm long, linear-oblong; awn 3.5–4.7 cm long, dark-brown or purplish-brown.

Throughout; common, often gregarious.

FLS & FRS : Aug.–Nov.

THYSANOLAENA Nees

Thysanolaena maxima (Roxb.) O. Ktze. Rev. Gen. Pl. 2:794. 1891; Bor 650; Patel 91:338. *Agrostis maxima* Roxb. Fl. Ind. 1:319: 1820. *Agrostis procera* Retz. Obs. 4:19. 1786. *Thysanolaena agrostis* Nees in Edinb. New Phil. Journ. 18:180. 1835; FBI 7:61; C 3:527. *Thysanolaena procera* (Retz.) Mez. in Janowski Bot. Archiv. 1:27. 1922; Blatter & McCann 201. t. 132.

1.2-4 m tall, stout grass. Leaves 30-60 × 0.5-1 cm, linear–lanceolate, coriaceous. Panicle large, 30–60 cm long, soft, glabrous. Spikelets minute, ±0.15 cm long, ovoid-lanceolate.

In hedges and in moist ground.

FLS & FRS : July-Dec.

TRACHYS Pers.

Trachys muricata (L.) Pers. ex Trin. Mem. Acad. Sci. Petersb. (Ser. VI) 3:189. 1834; Blatter & McCann 216. t. 143; Bor 369; Patel 91: 328. *Cenchrus muricatus* L. Mant. 302. 1767. *Trachys mucronata* Pers. Syn. 1:85. 1805; FBI 7:96; C 3:535; Blatter in Journ. Bombay nat. Hist. Soc. 17:166. 1909.

15-45 cm long, ascending or prostrate herbs, glabrous but for villous nodes. Leaves 2.5–10×0.6–1.3 cm, ovate-lanceolate, softly villous. Spike 2.5–5 cm long, on glabrous, more or less angular, short stipes. Cluster of spikelets 0.5–0.6 cm long, often partially sunk in the rachis. Perfect spikelet upto 0.6 cm long, imperfect ones much shorter.

Kutch, on sandy ground near sea (Blatter, 1909).

FLS & FRS : Aug.–Sep.

TRAGUS A. Hall. nom. cons.

Tragus biflorus (Roxb.) Schult. Syst. Veg. 2. Mant. 205. 1824; Bor 682; Patel 91:339; Ch & O 264; S & J 58. *Lappago biflora* Roxb. Fl. Ind. 1:284. 1820. *Tragus racemosus* Hk. f. in Hk. f. FBI 7:97. 1896; C 3:535 (non Scop. 1777). *Nazia racemosa* O. Ktze. Rev. Gen. Pl. 3:357. 1891; Blatter & McCann 217. t. 144.

10–20 cm tall, tufted, simple or branched, erect or diffuse herbs. Leaves 1–2 cm long, linear-lanceolate, flat. Racemes 1.5–3 cm long, solitary. Spikelets 0.25–0.3 cm long, pale-brown.

Tnroughout; not common. (VANDARIU GHAS)

FLS & FRS : July–Oct.

TRILOBACHNE Schenck ex Henr.

Trilobachne cookei (Stapf) Schenck ex Henr. in Meded. Rijksherb. 67:4. 1931; Bor 268. t. 31; Patel 91:321; S & J 58; S 321. *Polytoca cookei* Stapf in Hk. Ic. Pl. 24. t. 2333. 1894; FBI 7:101; C 3:519; Blatter & McCann 5. t. 2.

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Annuals, 60–90 cm tall. Leaves 45–60 × 5–7.5 cm, linear-lanceolate, hispid. Flowering branches fasciculately crowded in the axils of upper leaves. Male panicles 6–7.5 cm long; male spikelets 0.7–0.8 cm long, geminate, unequal, shortly pedicellate or sessile. Female spikelets as long as male spikelets, solitary.

Throughout (except Kutch); rather not common.

FLS & FRS : Sep.–Oct.

TRIPLOPOGON Bor

Triplopogon ramosissimus (Hack.) Bor in Kew Bull. 1954: 501. 1954 & Grasses of Burma, Ceylon, India & Pakistan 255. 1960; Patel 91:320; S 321. *Ischaemum ramosissimum* Hack. in DC. Mon. Phan. 6:249. 1889. *Ischamemum spathiflorum* Hk. f. in Hk. f. FBI 7:138. 1896; C 3:481. *Sehima spathiflorum* (Hk. f.) Blatter & McCann in Journ. Bombay nat. Hist. Soc. 32: 23. 1927 & Bombay Grasses 20. t. 13. 1935.

1 m tall, erect herbs, much branched from above. Leaves 30–45 × 0.8–2 cm, linear-lanceolate, almost petiolate, sparsely hairy. Racemes 4–5 cm long, more or less exerted from spathes. Sessile spikelet 0.8–1 cm long, narrowly lanceolate, pedicellate spikelet longer than the sessile one.

South Gujarat, in shaded spots.

FLS & FRS : Oct.

TRIPOGON Roth ex R. & S.

Key to species

1. Median awn as long as or longer than lemma, capillary, flexuous.. .. ..*T. capillatus*

1. Median awn shorter than the lemma, occasionally almost absent :

2. Perennials; roots wiry forming tufts; leaves glabrous :

3 Leaves and culms glaucous; leaves upto 20 cm long, involute; ligule very short but definite, ciliate... .. ..*T. jacquemontii*

3. Leaves and culms not glaucous; leaves 30–60 cm long, flat, sometimes rolled; ligule obsolete.. .. ..*T. lisboae*

2. Perennials; roots fibrous forming a close tuft; leaves covered with a mass of matted white hairs...*T. purpurascens*

Tripogon capillatus J. & S. Ill. Fl. Or. 4:47. t. 332. 1850–53; FBI 7:285; C 3:558; Blatter & McCann 267. t. 179; Bor 521; Patel 91:336; S 321.

15–45 cm tall, densely tufted, erect or geniculately ascending herbs. Leaves 15–20 cm long, very narrowly linear, convolute. Spikes 12.5–30 cm long, filiform or capillary, flexuous. Spikelets 3–4–flowered, distant, along the rachis of the spike, with many slender awns.

A species found in forests on rocky soils and also on trees (Patel, 1965).

FLS & FRS : Aug.–Oct.

Tripogon jacquemontii Stapf in Kew Bull. 1892:85.1892; FBI 7:286; C 3:559; Blatter & McCann 268. t. 181; Bor 522; Patel 91:336; S & J 58.

Perennial, 30–60 cm high. Leaves 5–20 cm long, convolute, glabrous. Spikes 10–20 cm long, narrow. Spikelets 0.8–2 cm long, narrow, oblong, 10–20 flowered.

Habitat similar to that of *T. capillatus* J. & S. Blatter & McCann (1935) cite loc. Gujarat–Lasundra.

FLS & FRS : Aug.–Sep.

Tripogon lisboae Stapf in Kew Bull. 1892:84. 1892; FBI 7:286; C 3:558; Blatter & McCann 267. t. 180; Bor 522; S 321.

Perennial, stout or slender, tufted herbs. Leaves 20–35 × 0.5–1 cm, flat or convolute. Spikes 15–20 cm long. Spikelets 0.6–1.3 cm long, densely crowded, 5–12–flowered.

Dangs; rare.

FLS & FRS : Sep.–Oct.

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Tripogon purpurascens Duthie in Roy. bot. Gard. Cal. 9:75. 1901; Bor 522; *Tripogon abyssinicus* Sensu Stapf apud Hk. f. FBI 7:287. 1896 (p. p. non Nees 1854). *Tripogon jacquemontii* Stapf var. *submuticus* Stapf apud Hk. f. FBI 7:286. 1896.

This species is similar to *T. jacquemontii* Stapf but differs from the latter in the surface of leaves and nature of roots; further the specific epithet *purpurascens* refers to purple tinge on the whole plant.

Chhotaudepur forest division (Singla); rare.

FLS & FRS : Aug.

TRITICUM L.

Triticum aestivum L. Sp. Pl. 85. 1753; FBI 7:367; C 3:574; Blatter & McCann 279; Bor 679; Patel 91:338; S & J 58; S 321; *Triticum sativum* Lam. Fl. Franc. 3:625. 1778; C 3:574. *Triticum vulgare* Vill. Hist. Pl. Dauph. 2:153. 1787; FBI 7:367.

30–60 cm tall, tufted herbs. Leaves linear to linear-lanceolate, flat, glabrous or hairy on one or both surfaces. Spikes 6–15 cm long, erect, compact, glabrous or hairy, awned or awnless. Spikelets distichous, laterally compressed, 3–5-flowered.

Cultivated; seldom an escape and then rare. (GHAHUN)

FLS & FRS : Dec.-Mar.

UROCHLOA P. Beauv.

Key to varieties *U. panicoides* P. Beauv.

1. Spikelets glabrous .. .. .. *U. panicoides* var. *panicoides*
1. Spikelets pubescent.. .. .. *U. panicoides* var. *pubescens*

Urochloa panicoides P. Beauv. var. *panicoides;* Bor 372. *Urochloa panicoides* P. Beauv. Agros. Ess. 53. t. 11. f. 1. 1812; Ch & O 253.

30–45 cm tall, erect or basally geniculate herbs. Leaves 4.2–10 × 0.8–1.5 cm, lanceolate, membranous, glabrous or sparsely hairy. Panicles of 7–9 racemes. racemes 1–2 cm long, on 1–1.5 cm long peduncles. Spikelets 0.25–0.3 cm long, lanceolate, glabrous, pale-straw-coloured.

North to south Gujarat; occasional.

FLS & FRS : July–Oct.

Urochloa panicoides P. Beauv. var. **pubescens** (Kunth) Bor, Grasses of Burma, Ceylon, India & Pakistan 372. 1960; Patel 91:328. *Urochloa pubescens* Kunth, Rev. Gen. Gram. 1:31. 1829 & Enum. Pl. 1:74. 1838. *Panicum helopus* Trin. in Spreng. Neue Entedeck. 2:84. 1821. *Urochloa helopus* (Trin.) Stapf in Prain, Fl. Trop. Afr. 9:595. 1920; Blatter & McCann 146. t. 93. *Panicum javanicum* Poir. Encycl. Suppl. 4:274. 1816; FBI 7:35; C 3:450.

Throughout; common to occasional.

FLS & FRS : July–Oct.

UROCHONDRA C. E. Hubb.

Urochodra setulosa (Trin.) Hubb. in Hk. Ic. Pl. sub tab. 3457. 1947; Bor 634; Patel 91:338; S & J 58. *Vilfa setulosa* Trin. in Mem. Acad. Sci. Petersb. (Ser. VI) 6:55. 1840. *Heleochloa dura* Boiss. Or. 5:447. 1884; FBI 7:236; C 3:532. *Heleochloa setulosa* (Trin.) Blatter & McCann, Bombay Grasses 205. t. 134. 1935.

Perennial, 15–25 cm long, densely fastigiate from a woody, inclined base. Leaves 7.5–15 cm long, involute, terete, rigid, coriaceous, glabrous. Inflorescence spike-like, 5–10 × 0.3–0.5 cm, solitary. Spikelets densely imbricate, 0.2–0.25 cm long.

Kutch and Saurashtra on sandy and salty ground along sea coast.

FLS & FRS : Nov.–Jan.

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VETIVERIA Lem.-Lisanc.

Vetiveria zizanioides (L.) Nash in Sm. Fl. South-east U. S. 67. 1903; Blatter & McCann 65. t. 40; Bor 258; Patel 91:320; S & J 58; S 322. *Phalaris zizanioides* L. Mant. 2:183. 1771. *Andropogon squarrosus* Sensu Hk. f. in Hk. f. FBI 7:186. 1896; C 3:511 (non L. f.).

Densely tufted, slender, perennial herbs, 120-150 cm tall. Leaves 10-15 cm long, rigid, flat or folded, ciliate on margins. Panicles 15-30 cm long, ovate-lanceolate or cylindric-oblong, terminal, with 4-12 whorled branches. Spikes 3-6 cm long, slender, linear, at length violet-brown, purplish or black. Spikelets 0·5-0.7 cm long, narrowly linear.

Throughout; common. (VALO, KHUS)

FLS & FRS : Aug.-Oct.

ZEA L.

Zea mays L. Sp. Pl: 971. 1753; FBI 7:102; C 3:574; Blatter & McCann 2; Bor 270; Patel 91:321; S & J 58.

Tall herbs, 2-3 cm high. Leaves 20-60 × 3-6.5 cm, linear, glabrous. Male panicles 25-30 cm long, terminal, above dense foliage. Female spike solitary, axillary.

Cultivated. (MAKAI)

FLS & FRS : July-Oct.

ZOYSIA Willd.

Zoysia matrella (L.) Merr. in Philipp. Journ. Sci. Bot. 7:230. 1912; Bor 684; Patel 91:339. *Agrostis matrella* L. Mant. Pl. 2: 185. 1771. *Zoysia pungens* Willd. in Ges. Naturf. Fr. Berlin Neue Schr. 3:441. 1801; FBI 7:99; C 3:537. *Osterdamia matrella* (L.) O. Ktze. Rev. Gen. Pl. 2:781. 1891; Blatter & McCann 219. t. 146.

Perennials, slender, 15-25 cm tall, erect, tufted, from 60-90 cm long, wiry root-stock with interlacing branches. Leaves 2.5-7.5 cm long, coriaceous, dorsally rounded. Racemes 2.5-3.8 cm long, erect. Spikelets 0·3-0.35 cm long, erect.

Common on sand dunes and salt marshes (Patel, 1965).

FLS & FRS : Sep.-Dec.

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Zinki Mundi 384
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Zinku Utingan .. ..
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[1075]

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ERRATA

P=page; L=line; R=read; f, n.=foot note; Pr=preface
Read *noms. cons.*

P	L	R
Pr	11	inconsistencies
5	8	heralds
6	9	scrub
	33	*Schleichera oleosa*
7	13	Hochr.
	33	*Azanza*
8	5	*pectinata*
10	3	(L.) Don
	26	Asclepiadaceae
11	30	Heliotropium
12	24	*hugelii*
15	25	PARASITES
	34	Lam., C.
16	9	McC.
	36	*Saccharum*
20	9	*Mazus*
27	f. n. 2 a	add Caesalpiniaceae
29	24	dehiscent
	36	trees
30	25	fleshy
32	4	Opiliaceae
46	23	Taccaceae
49	20	6:370
56	12	**sinensis**
77	12	flowers for leaves
111	22	CHHAS,
118	14	RUKH,
132	18	0.6
	24	1:33.
133	16	0.8
135	24	0.8
136	28	2–2.5
	29	0.8
137	5	MALPIGHIACEAE
138	29	DHAMASA,
141	after 28	**OXALIS L.**
150	5	6.5
	20	frequent.
152	10	f.
153	16	3.5
	29	Naturf.
	31	S47 (non Gaertn. 1788).
154	17	4.2
	20	1.2
155	10	15. Hort.
158	1	-merous,
159	25	1:654
162	25	beneath.
164	28	planted
172	26	*Astragalus*
177	after 28	*FLS. & FRS*: Dec.–Apr.
182	11	0.9
184	1	0.7
185	26	Roxb.
193	16	30–60
200	3	f.
201	21	puberulous
207	20	1825

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P	L	R
210	4	(L.)
	5	L.
212	29	5–18.8
213	3	condensed
	23	1.4
219	19	0.1
	27	*Indigofera*
220	12	cordifolia
221	4	0.8
223	5	rainfall.
	7	April-Dec.
	30	Illus.
224	8	Jacq..
225	21	—2 cm,
229	13	long, heads.
233	2	16;
236	22	**acuminatus**
236	2	55;
237	after 18	*FLS & FRS*: Feb. – Mar.
246	24	but not
247	10	*apollinea*
250	3	1762
	14	1861;
251	10	spherical,
	28	Suppl.
252	15	0.9
254	30	*hamosum*
255	3	racemes
257	25	cm.
261	21	Pods
266	1	C.
272	12	Througbout,
	18	( ).
277	21	*Bauhinia*
281	21	2:458.
285	13	1.5
	18	ravines,
	26	brown,
289	12	**Leucaena leucocephala**
290	3	brown
291	7	(excl .....).
300	18	7.5
	27	Gaertn.
303	13	0.8
	20	500.
307	26	1759;
308	17	W. & A.).
	28	Retz.
311	4	**Rotala serpyllifolia**
	6	Pl.
	7	f.
	10	0.2
314	2	550.
318	15	cm,
319	14	0.5
321	11	Oct.
325	1	climbers.
	7	Dec.
334	6	peduncles.
344	1	**candolleana**
347	5	L. f.
352	7	& for and
354	1	10.
358	8	common.
360	13	Saxton).
361	13	forests.
374	4	1.5
378	8	Ser.
379	9	L.
380	23	Saurashtra.

P	L	R
	26	192.
381	10	0.6
	14	escape.
	25	America.
385	29	America.
392	5	Cl.
394	16	non L.
403	28	Gen.
405	27	Blanco,
408	after 20	**DIOSPYROS** L.
	21	key to species
411	after 19	**NYCTANTHES** L.
416	1	Don
	10	f.
425	3	0.8
426	14	220.
427	7	rare.
	10	A.
	18	common.
429	14	115.
	22	0.6 – 0.7
430	12	83.
433	2	0.5
435	13	f.
439	20	1.2
444	16	*C. dichotoma*
447	6	paniculate
448	7	2.5
459	32	*Jacquemontia*
499	29	*oppositifolia*
509	4	f.
513	7	VAKUMBHO
530	10	seeds glabrous
539	15	Bremek.
582	1	31.
	13	2.5
583	24	5.3
585	22	white,
588	7	Sci.
594	8	*Amaranthus*
595	5	(L.)
	23	1825;
608	9	49;
621	7	Ham.
627	8	f.
635	25	Plum.
659	27	f.
666	after 22	MUSA L.
675	1	twiners:
691	21	).
694	16	ff.
696	16	Fl.
730	12	Mattf.
781	28	Spikelets not
791	1	in Prain
801	20	*Chrysopogon*
826	22	delete Poa
856	1	**Pennisetum**
871	24	Kew
882	17	2–3 m
890	22	1950
900	14	72:

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